massDOT
Massachusetts Department of Transportation
Highway Division

I-90 Allston Interchange Project, Boston, MA

A Multimodal Transportation Project

Draft Environmental Impact Report

INTERSTATE 90
ALLSTON
INTERCHANGE

November 30, 2017 | EEA No. 15278

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LIST OF ACRONYMS

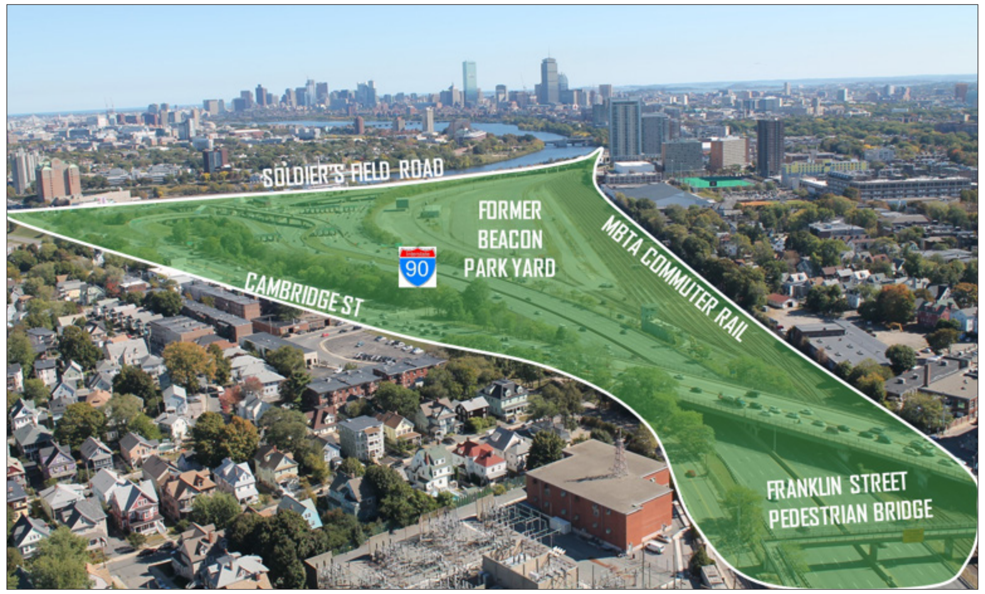
Acronym	Meaning
AAB	Massachusetts Architectural Access Board
AASHTO	American Association of State Highway and Transportation Officials
ABC	A Better City
ADA	American with Disabilities Act
AET	all electronic tolling
APE	Area of Potential Effect
BH-FRM	Boston Harbor Flood Risk Model
BLSF	Bordering Land Subject to Flooding
BPDA	Boston Planning and Development Agency
BMP	Best Management Practice
BPY	Beacon Park Yard
BTD	Boston Transportation Department
BU	Boston University
BWSC	Boston Water and Sewer Commission
CGP	Construction General Permit
CO	carbon monoxide
CO_2	carbon dioxide
CREC	controlled recognized environmental condition
CTPS	Central Transportation Planning Staff
DCR	Massachusetts Department of Conservation and Recreation
DDHV	Directional Design Hourly Volume
DEIR	Draft Environmental Impact Report
EDA	Economic Development Area
EEM	energy efficiency measure
EIR	Environmental Impact Report
ENF	Environmental Notification Form
EOEEA	Executive Office of Energy and Environmental Affairs
EJ	Environmental Justice
FEIR	Final Environmental Impact Report
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GHG	greenhouse gas
GJR	Grand Junction Railroad
HDPE	high-density polyethylene
HC	hydrocarbons
hp	horsepower
HREC	historic recognized environmental condition
IMP	Institutional Master Plan
Leq	equivalent continuous noise level
lf	linear feet
LMA	Longwood Medical Area
LOS	Level of Service
LRTP	Long-Range Transportation Plan
LUW	Land Under Water
MassDEP	Massachusetts Department of Environmental Protection
MassDOT	Massachusetts Department of Transportation
MassGIS	Massachusetts Geographical Information Systems
MA WPA	Massachusetts Wetlands Protection Act
MBTA	Massachusetts Bay Transportation Authority
MCP	Massachusetts Contingency Plan
MDRP	Massachusetts Diesel Retrofit Program
MEPA	Massachusetts Environmental Policy Act
MHC	Massachusetts Historical Commission
MPO	Boston Region Metropolitan Planning Organization
MWRA	Massachusetts Water Resources Authority
MSATs	Mobile Source Air Toxics
MUTCD	Manual on Uniform Traffic Control Devices
MVMT	million vehicles miles traveled
NAC	MassDOT Noise Abatement Criteria
NAICS	North American Industry Classification System
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP NR-Eligible NR-Registered	National Register of Historic Places
NRCS	United States Natural Resources Conservation Service
OHM	oil and hazardous materials
OWS	oil/water separators
PDW Path	Dr. Paul Dudley White Bike Path
PM_{10}	coarse particulate matter
$PM_{2.5}$	fine particulate matter
PTZ	Pan Tilt Zoom camera
RC	reportable concentrations
REC	recognized environmental condition
ROW	right-of-way
sf	square feet
SFR	Soldiers Field Road
SHPO	State Historic Preservation Office
SLR	sea level rise
SO_2	sulfur dioxide
SSX	South Station Expansion
SWPPP	Storm Water Pollution Prevention Plan
TAPA	Transportation Access Plan Agreement
TAZ	Traffic Analysis Zones
TDM	Transportation Demand Management
TMDL	Total Maximum Daily Load
tpy	tons per year
TTC	temporary traffic control
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDOT	United States Department of Transportation
U.S. EPA	United States Environmental Protection Agency
USGS	United State Geological Survey
v/c	volume-to-capacity
VOCs	volatile organic compounds
vph	vehicles per hour

1 Project Summary

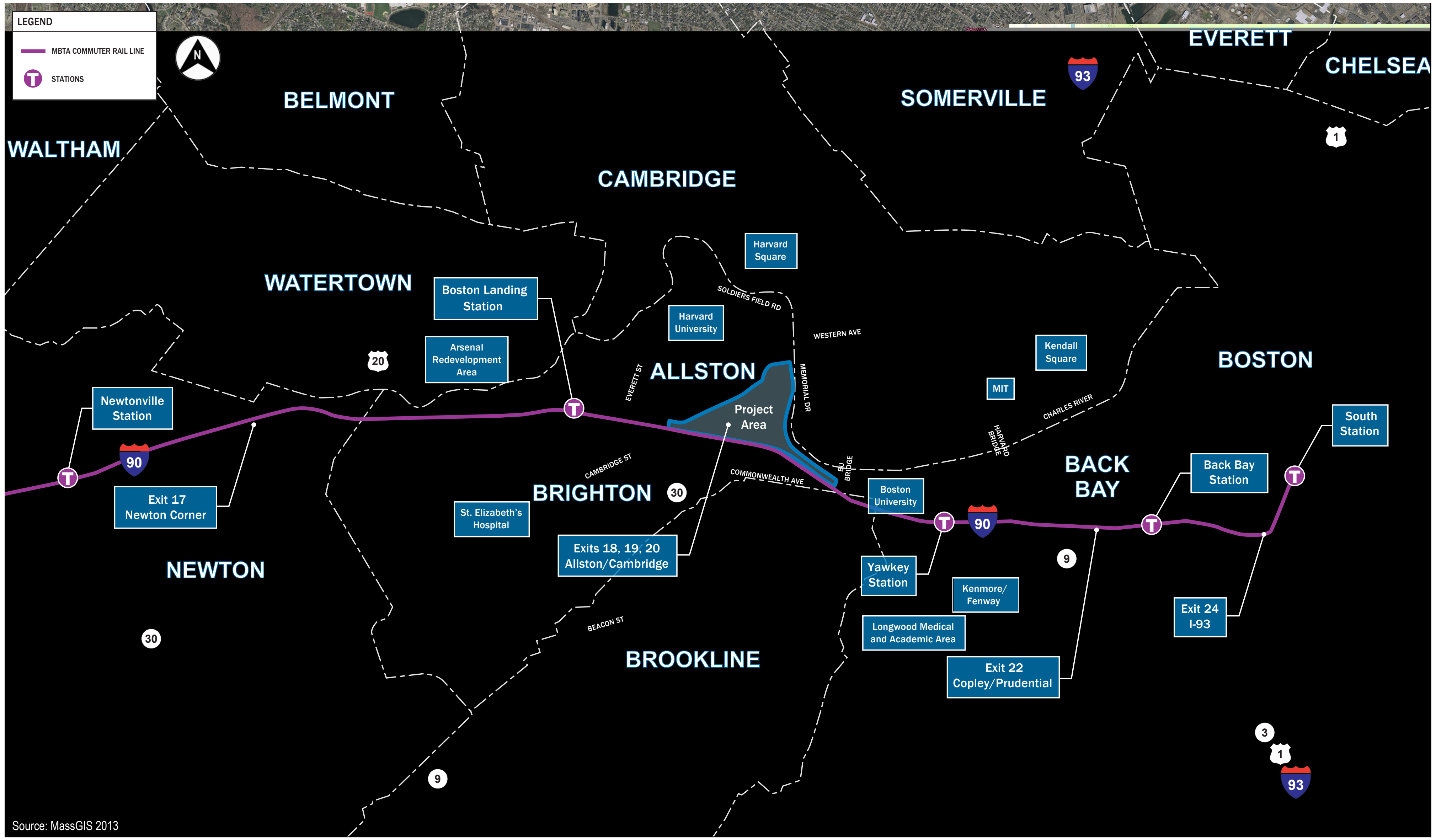
1.1 Project Identification and Overview

This Draft Environmental Impact Report (DEIR) describes the Interstate 90 (I-90) Allston Interchange Project (the Project) located in Boston, Massachusetts. The Massachusetts Department of Transportation (MassDOT) proposes to replace the existing highway interchange with a new multi-modal urban interchange that meets the needs of motorists, pedestrians, bicyclists and mass transit (light and heavy commuter rail, bus and shuttle) users while accommodating potential future mixed-use development. An Environmental Notification Form (ENF) for the Project was filed on October 31, 2014 and published in the Environmental Monitor on November 5, 2014, Executive Office of Energy and Environmental Affairs (EOEEA) File Number 15278. On December 24, 2014, the Secretary of the EOEEA issued a Certificate on the Project (the Secretary's Certificate) requiring MassDOT to prepare an Environmental Impact Report (EIR).

The location of the Project is the area of the former Beacon Park Yard (BPY), historically a rail yard, a portion of which was partially utilized to construct the Massachusetts Turnpike and the original Allston interchange and toll plaza. Graphic 1.1-1 shows the Project locus in regional context; the illustration below shows an aerial view of the Project locus. The Project Area and the major features of the Project are shown on pages 4, 5 and 6.


SOLDIER'S FIELD ROAD
FORMER BEACON PARK YARD
90
CAMBRIDGE ST
MBTA COMMUTER RAIL
FRANKLIN STREET PEDESTRIAN BRIDGE

Aerial view of Project locus looking east


LEGEND
MBTA COMMUTER RAIL LINE
STATIONS
N
WALTHAM
BELMONT
CAMBRIDGE
SOMERVILLE
EVERETT
CHELSEA
93
1
WATERTOWN
Boston Landing Station
Arsenal Redevelopment Area
20
Harvard Square
SOLDIERS FIELD RD
Harvard University
WESTERN AVE
ALLSTON
EVERETT ST
MEMORIAL DR
Project Area
Kendall Square
MIT
CHARLES RIVER
HARVARD BRIDGE
BOSTON
South Station
Newtonville Station
90
Exit 17 Newton Corner
NEWTON
30
CAMBRIDGE ST
BRIGHTON
30
COMMONWEALTH AVE
BU BRIDGE
St. Elizabeth's Hospital
Exits 18, 19, 20 Allston/Cambridge
Boston University
90
BACK BAY
Back Bay Station
9
Yawkey Station
Kenmore/ Fenway
Longwood Medical and Academic Area
Exit 22 Copley/Prudential
Exit 24 I-93
BEACON ST
BROOKLINE
9
3
1
93

Source: MassGIS 2013

Graphic 1.1-1: Project locus in regional context

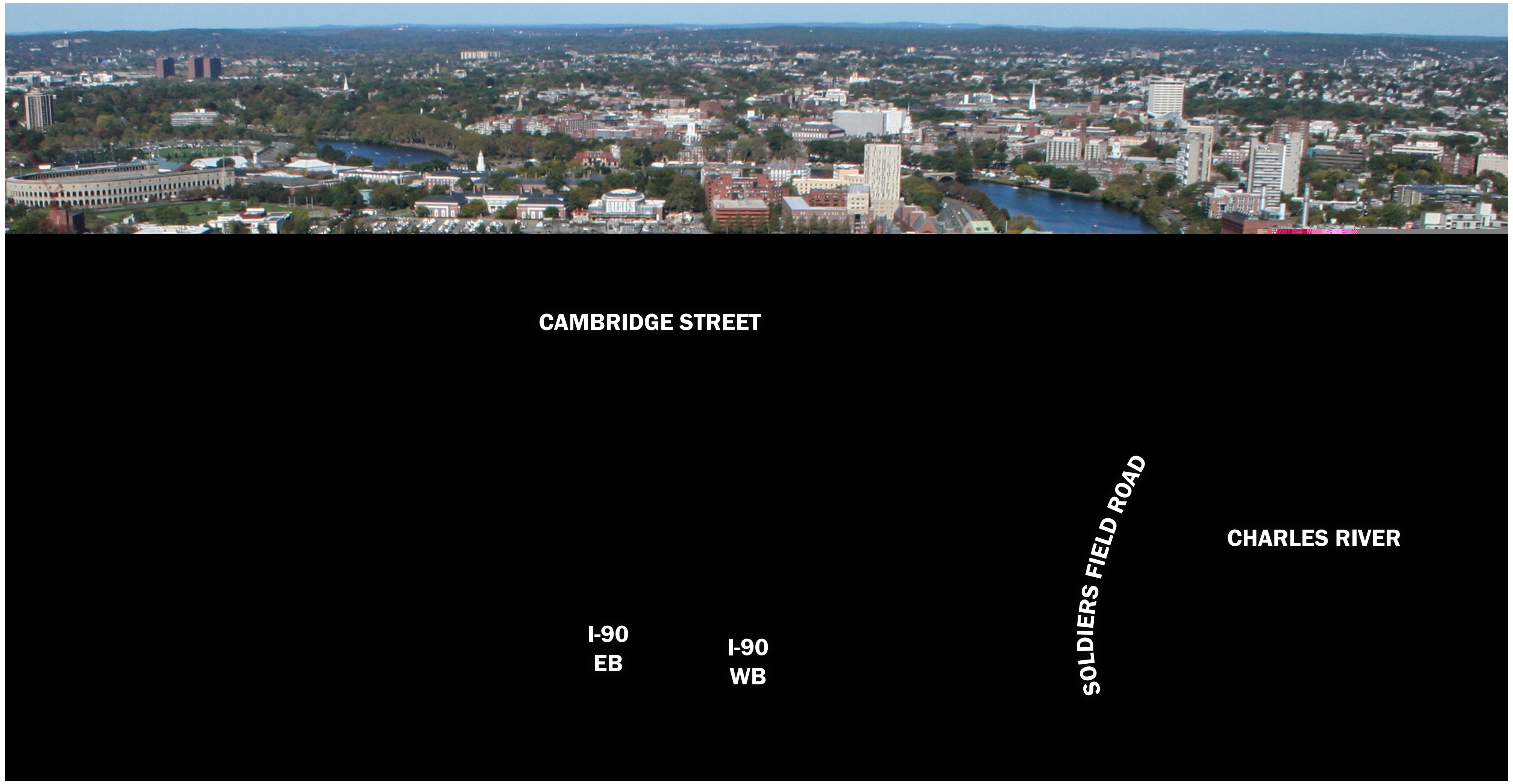
The Purpose and Need for the Project is described in detail in Chapter 2. The Project will replace the deteriorating I-90 viaduct, realign I-90 to accommodate recent improvements for All Electronic Tolling (AET), and improve safety and function. The Project will also improve transit and other multi-modal opportunities by creating a new train station (West Station), providing pedestrian and bicycle infrastructure, and accommodating future development within the urban interchange street network. In addition, the Project will preserve for the Massachusetts Bay Transportation Authority (MBTA) much needed commuter rail layover space within an area historically used for railroad purposes.

In a broader sense, the Project will contribute to MassDOT's goal to improve the reliability of the Commonwealth's transportation infrastructure and achieve a system-wide State of Good Repair. Decisions on prioritizing transportation infrastructure investments are geared towards efficiently attaining a State of Good Repair, focusing on maintaining and improving conditions of existing assets to provide functional, reliable and safe operation while managing life-cycle costs.

Since the publication of the ENF, MassDOT has refined and enhanced the Preferred Urban Interchange Alternative described in the ENF, as required by the Secretary's Certificate. This work has been performed in collaboration with a broad range of stakeholders including: the Project Task Force; the City of Boston; Harvard University, an abutter and the owner of the land underlying much of the Project Area; Boston University (BU), an abutter; and other abutters and public groups (see Chapter 9). The Task Force is comprised of local residents and activists, members of the Allston business community, and representatives of key institutional stakeholders such as Harvard University and BU.

The options for reconstructing and improving the I-90 Allston Interchange contained within this DEIR have benefited from extensive public input. In getting to this DEIR, MassDOT hosted seven public information meetings, not only in Allston, but in the adjoining communities of Brookline and Cambridge. MassDOT also hosted a site walk open to the community, participated in community-led meetings with the Allston-Brighton Community Development Corporation (CDC) and Main Streets organization, and held over twenty meetings with the Task Force, including a series in the spring of 2016 that focused on future place-making in BPY, offered jointly with the Boston Planning and Development Agency (BPDA).

To the greatest extent possible, given the limitations of "moving meetings" like the April 2016 site walk and the City of Boston open house in Allston where interactions were by nature short question-and-answer events, the Project has provided the community with extensive documentation of the public process in the form of presentations, minutes and key Project documents like the ENF. The documentation has been made available through the Project website (www.massdot.state.ma.us/highway/HighlightedProjects/AllstonI90InterchangeImprovementProject). This was done with the understanding that, while the Project interacted with hundreds of community members in Allston, Cambridge and Brookline, as well as the 40+ member Task Force, there were many interested members of the community for whom evening public information meetings presented a difficulty with work, family life, commuting patterns or all three. Materials were also made available on-line with the understanding that transportation decisions made in Allston have impacts not only in the adjoining communities of Brookline and Cambridge, but for commuters entering Boston from the north, south and west. A listing of the meetings held and a full account of the public involvement process is provided in Chapter 9. The meeting minutes can be found at http://www.massdot.state.ma.us/highway/HighlightedProjects/AllstonI90InterchangeImprovementProject/Documents.aspx.



Aerial view looking northwest

The refinement process undertaken for the Project concept is described in detail in Chapter 3. This process was guided by both the Secretary's Certificate and the extensive input of the Task Force and stakeholders. The refinement process yielded an improved urban interchange entitled "Preferred Alternative 3K." Preferred Alternative 3K includes three variations in the "Throat Area," which is defined as the relatively narrow existing multi-modal (highway, road, rail, bicycle, pedestrian) section where the I-90 highway viaduct is situated between the Charles River and BU, and above both the Worcester Main Line and the Grand Junction Railroad (GJR) tracks. The Throat Area extends from the I-90 underpass at Commonwealth Avenue to a point 2,500 feet to the west, opposite Agganis Way. The three Throat Area Variations are referred to as:

- Highway Viaduct (3K-HV Variation)– Elevated Highway/Rail at grade
- Amateur Planner (3K-AMP Variation)– Elevated Rail/Highway at grade
- A Better City (3K-ABC Variation)– Highway and Rail at grade

The three variations differ within the Throat Area, while the vast majority of the remaining 3K interchange alternative remains similar for all variations in terms of geometry, performance and features. The concepts for two of the variations, 3K-AMP and 3K-ABC, were specifically recommended by Task Force members, as described in more detail in Section 3.3. The conceptual design parameters for 3K-AMP and 3K-ABC are represented in this DEIR as recommended by the Task Force members who developed them. The intent of the ABC Concept, as submitted to MassDOT, was to not impact the resource areas associated with the Charles River. When the highway and railroad cross section provided by ABC was applied to the detailed existing site constraints, minor impacts to resource areas resulted.

This chapter provides a brief summary of impacts for the Preferred 3K Interchange Alternative and the three Throat Area Variations. Chapter 5 provides a detailed analysis of impacts and describes the differences among the Throat Area Variations. In summary:

- All variations provide improved mobility for pedestrians, bicycles, vehicles and mass transit.
- All variations support goals for an urban street network and future development of the interchange area.
- 3K-HV provides superior operational effectiveness and efficiencies through the incorporation of usable shoulders while minimizing impacts from construction staging, minimizing impacts on railroad operation from construction, and achieving a balanced, safe and context-sensitive design.

- 3K–AMP decreases the visual impact of highway viaduct structure by creating a rail viaduct and has roughly equal environmental resource impacts as 3K-HV. It carries the highest capital cost and involves complicated construction staging with longer term impacts to rail operations from construction and the least flexibility for future railroad operations.
- 3K-ABC eliminates viaducts and their visual impacts completely in the Project Area and offers a marginal cost advantage, but results in a more restrictive rail operations environment than 3K-HV. It creates greater environmental and historic resource impacts than the other variations. Like 3K-AMP, it involves complicated construction staging with longer term impacts to rail operations from construction.

The No Build Alternative is also described and evaluated in this DEIR. The No Build would consist of rehabilitating the existing viaduct and leaving the rest of the interchange in its current configuration (with the recent removal of toll booths and the reconfiguration of the original toll plaza), while preserving MBTA layover space and allowing use of the existing layover tracks. This alternative, while not meeting the traffic safety, mobility and future development aspects of the Project Purpose and Need, would provide crash tested safety barriers and improve lighting, riding surfaces and drainage. The No Build Alternative carries the lowest cost for implementation while addressing MassDOT's most critical need.

The intent of this DEIR is to gather public and stakeholder input on the Urban Interchange Preferred Alternative and the Throat Area Variations. This input and subsequent public participation will assist MassDOT in selecting a Throat Area Variation and in further defining and refining a Project Alternative to be documented in the Final Environmental Impact Report (FEIR).

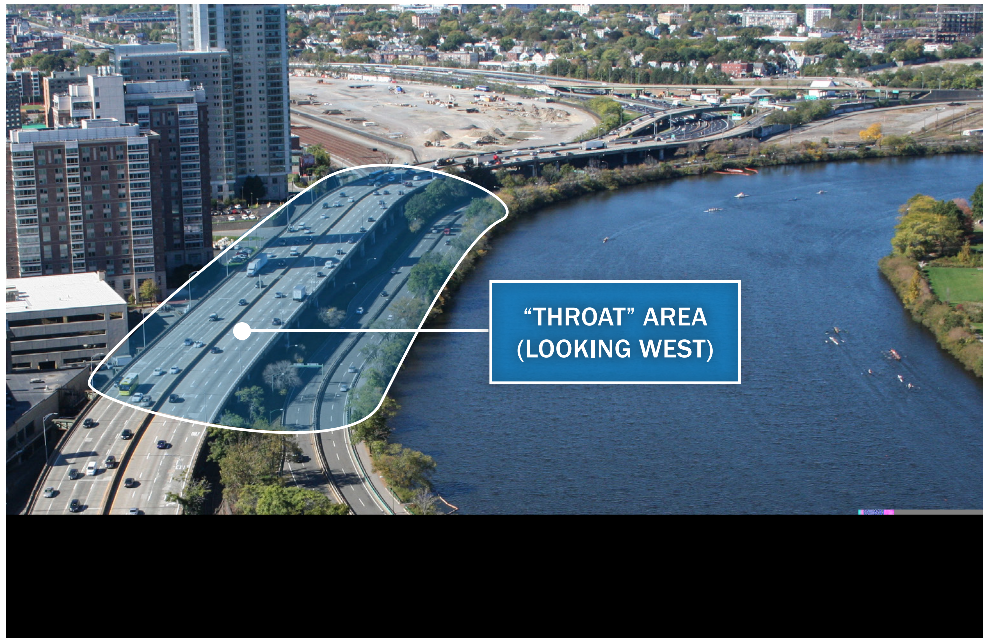
1.1.1 Project Updates and Changes Since the ENF Filing

The Secretary's Certificate and information contained in the ENF included the following regarding the Project size and environmental impacts:

- 1.3 acres of non-water dependent tidelands impacts
- An undetermined amount of square feet (sf) of new other wetland alteration
- Addition of 70 parking spaces for rail layover facility staff parking
- Increase in 5,700 gallons per day (gpd) of water usage and waste water generation
- Reduction in impervious area by 4.7 acres from 67 to 62.3
- 147,000 average daily trips (ADT) on I-90 (2012 traffic count)

The following represents the updated Project size and environmental impacts since the ENF filing. These impacts include the I-90 Urban Interchange Preferred Alternative:

- Conversion of non-water dependent tidelands to water dependent riverfront park:
  - 3K-HV: 2.26 acres
  - 3K-AMP: 2.34 acres
  - 3K-ABC: 1.58 acres
- Permanent impacts to Chapter 91 Flowed Tidelands
  - 3K-HV: 60 sf
  - 3K-AMP: 60 sf
  - 3K-ABC: 1,100 sf



Aerial perspective of Throat Area

- No impacts to Riverfront Area as the Project is exempt from Riverfront Area requirements because it is subject to a Chapter 91 License under the Public Waterfront Act
- Square feet of new other combined temporary and permanent wetland alteration:
  - 3K-HV: 240 sf impact to Land Under Water (LUW), 90 linear feet (lf) to Bank
  - 3K-AMP: 240 sf impact to LUW, 90 lf to Bank
  - 3K-ABC: 3,960 sf impact to LUW, 440 lf to Bank and 2,300 cf of Bordering Land Subject to Flooding (BLSF)
- Reduction of parking spaces for layover facility staff from 70 to 20
- Increase of 10,600 gpd water usage and 550 gpd waste water generation
- Reduction in impervious surface:
  - 3K-HV: -3.6 acres
  - 3K AMP: -5.3 acres
  - 3K-ABC: -4.2 acres
- 154,000 ADT on I-90 (2016 updated traffic count, an increase of 7,000 since the ENF filing)

The following permits were identified for the Project in the ENF filing:

- Chapter 91 License - Massachusetts Department of Environmental Protection (MassDEP)
- Notification Prior to Construction or Demolition - MassDEP
- Review under M.G.L. Chapter 9, Section 26-27C as amended by Chapter 254 of the Acts of 1988 - Massachusetts Historical Commission (MHC)
- Consistency Review - Massachusetts Coastal Zone Management (CZM)
- Access Permit - Department of Conservation and Recreation (DCR)
- 8(m) Permit - Massachusetts Water Resources Authority (MWRA)
- Building Permit - Department of Public Safety
- Sewer Use Discharge Permit, a Group Permit or a General Permit (To Be Determined) - MWRA

The following additional permits were identified for the Project since the ENF filing:

- Massachusetts Wetlands Protection Act, 310 CMR 10.00 - MassDEP
- Section 404/10 of the Clean Water Act - U.S. Army Corps of Engineers (USACE)
- Section 401 Water Quality Certification - MassDEP

Note: The CZM Consistency Review originally identified in the ENF will not be required since the Project is not located within the Coastal Zone.

The following adjustments were made to the Design Year:

- The Project Design Year was adjusted from 2035 to 2040 in order to be consistent with the planning horizon of other major MassDOT infrastructure projects within the Boston Metropolitan Region. It was also adjusted to ensure that the Central Transportation Planning Staff (CTPS) modeling for the Project relied on land use and infrastructure assumptions that were consistent with these other MassDOT projects, as well as the Boston Metropolitan Planning Organization's (MPO) current Long-Range Transportation Plan (LRTP), *Charting Progress to 2040*.
- The Opening Year analysis was adjusted from 2020 to 2025 for two reasons: (1) completion of Project construction by 2025 was determined to be more realistic than by 2020, given the current status of the Project environmental review and permitting; and (2), to take advantage of the 2025 regional land use projections that had been previously developed by CTPS, which could be readily applied to the transportation modeling prepared for this Project Alternative. The CTPS model for the Opening Year Alternative also includes regional transit and highway infrastructure projects that are on the LRTP, but only those that are expected to be completed by 2025.

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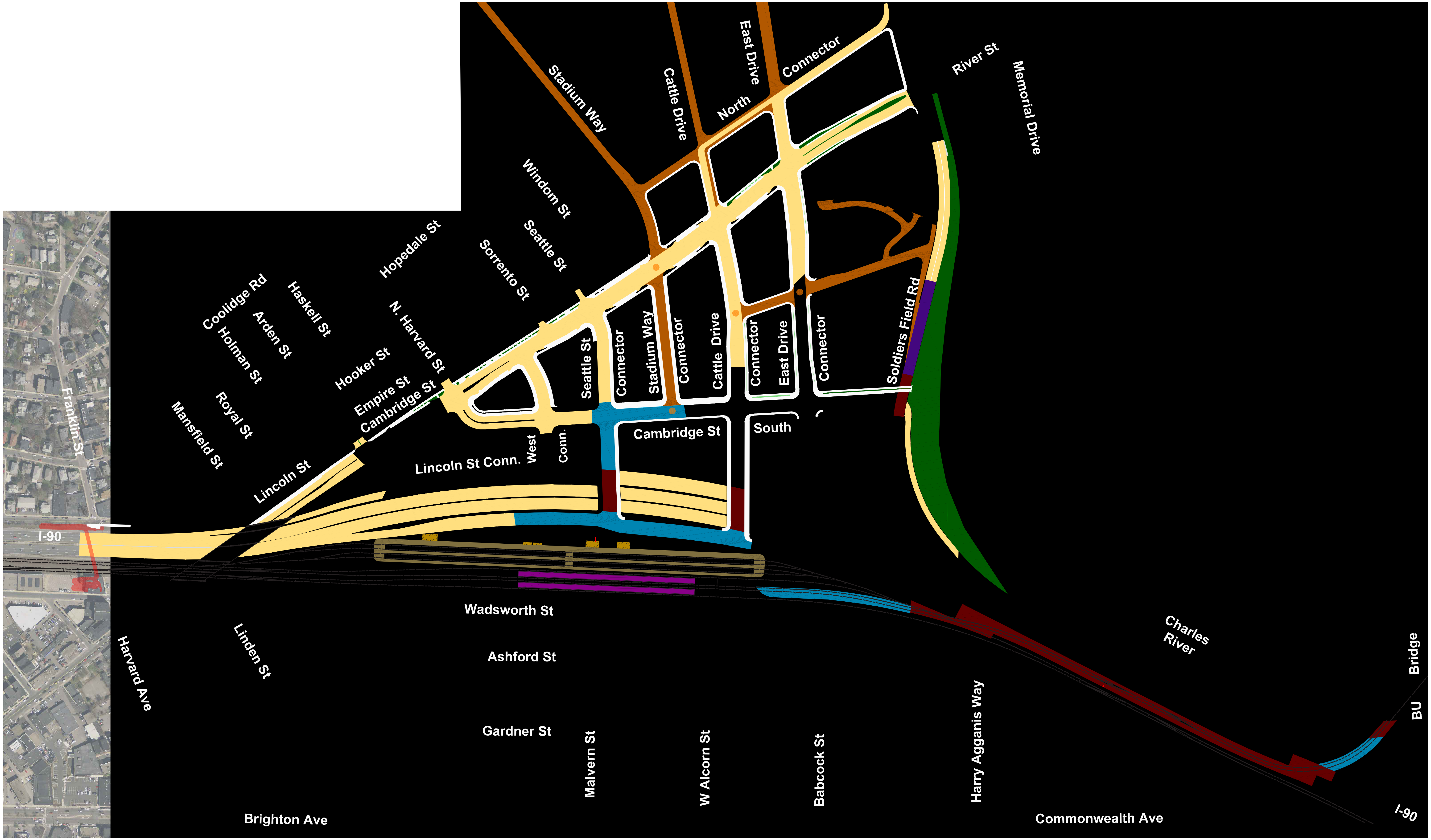
Massachusetts Department of Transportation
Highway Division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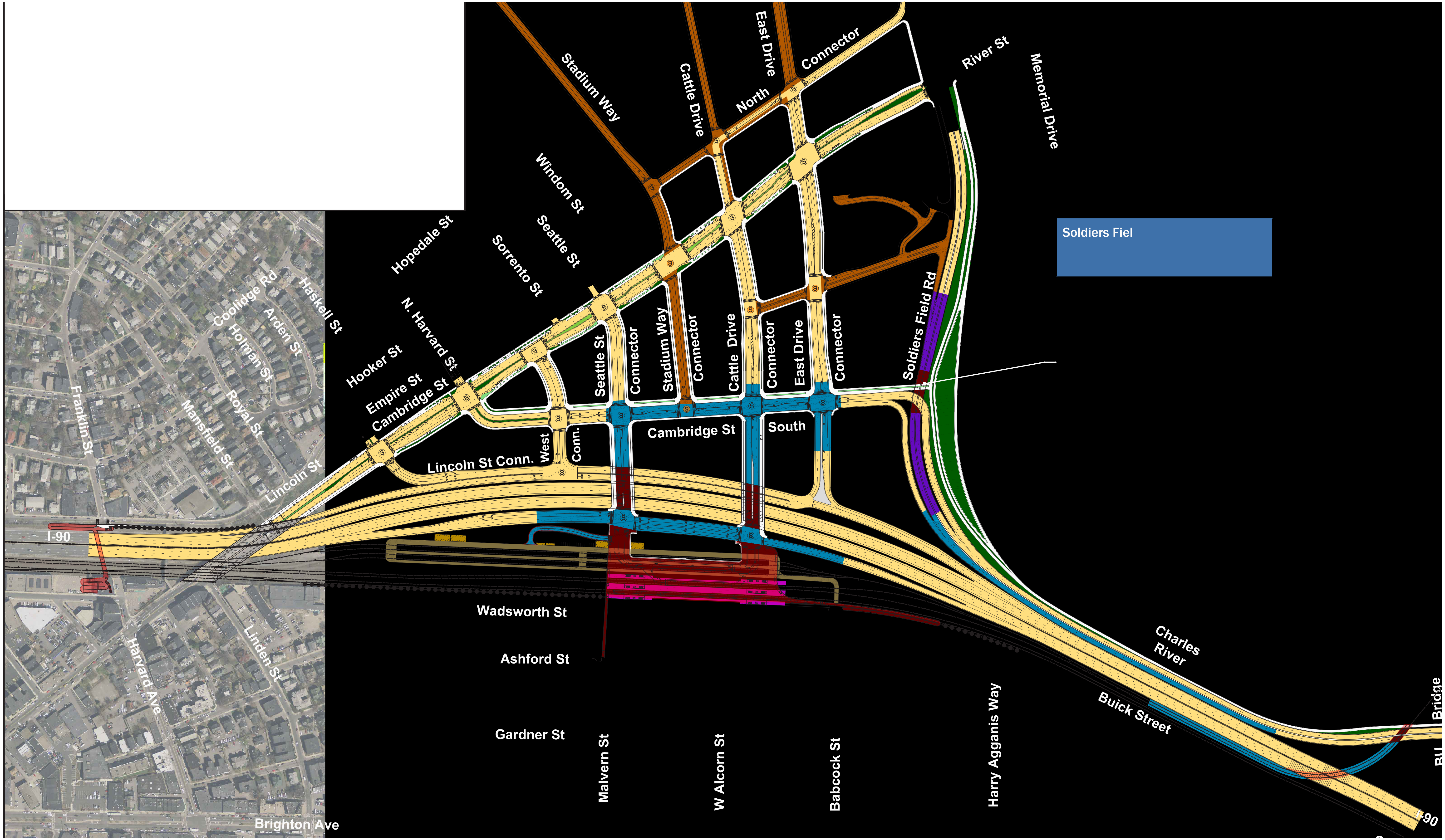
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Babcock St
Harry Agganis Way
Charles River
Buick Street
Bridge
BU
I-90
Harvard Ave
Linden St
Brighton Ave

I-90 Urban Interchange, 3K-ABC

FORMER BEACON
PARK YARD

Aerial view of the former BPY

1.2 Project Description

MassDOT proposes to construct a comprehensive multi-modal transportation improvement project at the existing Allston-Brighton interchange area on I-90 in the Allston neighborhood of Boston, Massachusetts. The Project consists of I-90 realignment and interchange reconstruction, the creation of open space, the development of a new urban street grid to connect I-90 to the local roadways, the accommodation of commuter rail layover space for the MBTA, the introduction of new pedestrian and bicycle facilities, and the development of a new commuter rail station. Specifically, I-90 will be realigned to the south into the northern portion of BPY. Within the proposed interchange, the I-90 mainline will consist of three travel lanes and shoulders in each direction, and widen to four travel lanes and shoulders outside of the interchange.

A split diamond, urban style interchange will be constructed to provide improved safety and traffic operations, allow for the construction of a comprehensive package of improvements for alternative modes of transportation, and enable future economic development. The Preferred Alternative Project elements include:

- I-90 Urban Interchange
- Dedicated pedestrian and bicycle infrastructure
- Soldiers Field Road (SFR) realignment
- Rail operations and West Station

I-90 Urban Interchange. The section of the I-90 Interchange west of the Charles River, herein referred to as the "I-90 Urban Interchange," will be realigned to the south of its existing location. The removal of grade-separated ramps at Cambridge Street and replacement with an urban street grid will allow for the reconstruction of Cambridge Street as a "Complete Street" (i.e. recommended to be "multi-modal, green and smart"). The area southeast of the interchange along the Charles River, the Throat Area, will also be replaced. Three Throat Area Variations have been studied for this DEIR, with the difference between them being the type of structure (viaduct or at grade).

Dedicated Pedestrian and Bicycle Infrastructure. The Project will provide extensive bicycle and pedestrian infrastructure improvements including the creation of new connections to SFR and the replacement of the existing bridge connections over I-90 with a new pedestrian and bicycle bridge. The new pedestrian and bicycle bridge will meet Americans with Disabilities Act/Massachusetts Architectural Access Board (ADA/AAB) requirements and maintain connections from the Franklin Street/Lincoln Street area to Cambridge Street.

SFR Realignment. A major component of the Project will be realigning SFR and separating it from the river and the Dr. Paul Dudley White Bike Path (PDW Path), which will result in the creation of open space. The realignment will allow for the construction of separate bicycle/pedestrian paths along the river, a new bicycle/pedestrian connection to the river spanning SFR over a "boat section," and new on-off- ramps from the proposed urban street grid.

Rail Operations. A commuter rail layover yard will be constructed to meet existing and future MBTA commuter rail layover needs west of South Station. The facility will be located within BPY and developed with layover tracks that accommodate 16 train sets in the interim condition and eight train sets in the final Build condition with West Station in place.

West Station: A new multi-modal transit station will be constructed within BPY, in a location less than 1 mile east of the new Boston Landing Station, 1.3 miles west of the Yawkey Way Station and south of the realigned I-90. The station will include a high two- or three-platform, four-track arrangement to facilitate existing service along the Worcester Main Line Branch of the MBTA commuter rail system and provisions for future two-track service along the GJR branch into Cambridge. The conceptual design of West Station includes: two or three platforms (depending on the variation selected), serving commuter rail tracks with access provided via a station structure on a mezzanine level over the platforms; local street and station connections for pedestrians and bicycles to Malvern Street and Babcock Street; and a bus port with connections to the I-90 interchange via a viaduct loop over I-90.

1.2.1 Throat Area Variations

As mentioned previously, there are three Throat Area Variations: 3K-HV, 3K-AMP and 3K-ABC. The 3K-HV Variation is the latest design by MassDOT that has the highway on viaduct and the rail at grade. The 3K-AMP has the rail on viaduct and the highway at grade, and the 3K-ABC has both the highway and rail at grade. The 3K-AMP and the 3K-ABC were initially developed by a local representative and the civic group A Better City, respectively. The major differences between the variations, in terms of operational components and environmental factors, are summarized below. A full assessment of the impacts of each alternative is presented in Chapter 5.

1.2.1.1 Key Operational Components

3K-HV Variation. This variation will maintain existing and proposed future rail infrastructure at grade, and the highway will be located on viaduct, as it is today. The 3K-HV Variation will provide 12-foot-wide travel lanes, 4-foot-wide inside shoulders, and 8-foot-wide outside shoulders on the I-90 viaduct, which will help to improve safety as compared to existing conditions. This variation will also provide for a widened PDW Path to 12 feet and a widened landscaped buffer between the PDW Path and SFR. Rail layouts will allow for a future two-track connection to the GJR without the need to impact the existing GJR Bridge over SFR. This variation does not preclude the reconstruction of the GJR Bridge in the future or associated additional PDW Path connections near the GJR and BU Bridges. As I-90 in this area will be on viaduct, it will not require additional stormwater pumping and stormwater treatment improvements can be achieved below the elevated viaduct.

3K-AMP Variation. This variation will remove the highway viaduct and replace it with a partially at-grade/below-grade I-90 section. (The terms, "below grade" or "depressed" refer to a design that places the surface of the roadway below the elevation of the existing ground.) 3K-AMP will have a substandard 11-foot-wide travel lane and a 2-foot-wide shoulder width in a straighter alignment (as referenced in Section 3.3.2), place the GJR tracks on a viaduct over I-90 eastbound, and put the Worcester Main Line tracks partially at grade/below grade. Variation 3K-AMP will not provide the increased operational and safety benefits on I-90 in the Throat Area as 3K-HV because of its narrower travel lanes and shoulder widths. This variation will provide a widened PDW Path to 12 feet with a landscaped buffer between the PDW Path and SFR. It will encroach onto BU property, impacting existing parking facilities, structures and utilities.

Table 1.2-1: Environmental Factors Differentiating the Throat Area Variations

Environmental Factors	Throat Area Variation		
	3K-HV	3K-AMP	3K-ABC
Open Space 4(f) Parkland Impacts	**Direct:** 15,250 square feet (sf) **Indirect:** 6,000 sf	**Direct:** 24,000 sf	**Direct:** 47,000 sf
Historic 4(f) Impacts	**Direct:** 15,250 sf	**Direct:** 24,000 sf	**Direct:** 47,000 sf
Article 97	**Direct:** 15,250 sf	**Direct:** 24,000 sf	**Direct:** 47,000 sf
Net New Public Open Space Creation	4.8 acres	5.0 acres	4.3 acres
State Wetland Resource Alterations (Roadway/Path)	No alteration	No alteration	**Temporary:** 3,300 sf Land Under Water (LUW), 20 linear feet (lf) Bank **Permanent:** 420 sf LUW (fill), LUW (dredge), 330 lf Bank, 2,300 cubic feet Bordering Land Subject to Flooding
State Wetland Resource Alterations (Stormwater Discharge Pipes)	**Temporary:** 200 sf LUW and 80 lf Bank **Permanent:** 40 sf LUW and 10 lf Bank		
Federal Inland Waters of the U.S. Impacts (Roadway/Path)	No alteration	No alteration	**Temporary:** 3,300 sf Waters of the U.S. (WUS) **Permanent:** 1,100 sf WUS
Federal Inland Waters of the U.S. Impacts (Stormwater Discharge Pipes)	**Temporary:** 200 sf WUS **Permanent:** 60 sf WUS		
Chapter 91 Waterways Filled Tidelands Impacts (Roadway/Path)	Conversion of 2.26 acres of non-water dependent roadway use to water dependent (WD) public park use	Conversion of 2.34 acres of non-water dependent roadway use to WD public park use	Conversion of 1.58 acres of non-water dependent roadway use to WD public park use
Chapter 91 Waterways Flowed Tidelands Impacts (Stormwater Discharge Pipes)	**Temporary:** 200 sf flowed tidelands **Permanent:** 60 sf flowed tidelands (dredge) WUS		
Chapter 91 Waterways Flowed Tideland Impacts (Roadway/Path)	No alteration	No alteration	**Temporary:** 3,300 sf of flowed tidelands **Permanent:** 1,100 sf of flowed tidelands (dredge) flowed tidelands

Unique to this variation is an elevated shared-use path, located adjacent to the elevated GJR line that spans over I-90, connecting West Station to the PDW Path. This variation will include accommodation for a future two-track connection to the GJR. It requires the GJR Bridge over SFR to be rebuilt.

SFR will be realigned to create additional open space along the Charles River and a new PDW Path connection below the BU Bridge and the reconstructed GJR Bridge. The new PDW Path connection will be in addition to the existing section of path over the Charles River. Stormwater pumping will be required to remove stormwater from the below-grade portion of I-90.

3K-ABC Variation. This variation will remove the highway viaduct and replace it with a partially at-grade/below-grade I-90. It will have substandard travel lane and shoulder widths in a straighter alignment (as referenced in Section 3.3.3), and incorporate both the Worcester Main Line and GJR tracks at grade. Similar to 3K-AMP, this variation will not provide the operational and safety improvements on I-90 offered by 3K-HV.

The 3K-ABC Variation will present a wider at-grade cross section, as compared to 3K-HV and 3K-AMP, to accommodate the highway, mainline commuter rail, GJR freight and PDW Path pedestrian/bicycle uses. It will require a retaining wall and fill along the slope of the Charles River to support the PDW Path. To minimize further encroachment into the Charles River, the 3K-ABC Variation limits the width of the PDW Path to 8.5 feet within the narrowest

operations of the BPY layover area also increase locomotive emissions. Project-related emissions for the three Throat Area Variations will likewise be higher by an average of about 17% when compared to the 2040 No Build Alternative emissions. Proposed mitigation measures will reduce the growth of Project-related emissions between the 2040 No Build and 2040 Build Alternatives by 2.1%.

Hot spots are areas where concentrations of one or more air pollutants are expected to be elevated. A CO Hot Spot analysis was conducted for the Project. For the Project Area, the analysis evaluated the five worst-case intersections based on level of service

7 feet riverward beyond elevation 2 into federal WUS. The portion of the 3K-ABC layout riverward of elevation 4 will be supported by fill and a retaining wall located within the state and federal resource areas and result in the direct alteration of LUW, Bank underlying an Anadromous/Catadromous Fish Run, BLSF and a Navigable Water of the U.S. The alteration of federal and state wetlands is quantified in Table 1.2-1.

Waterways

The I-90 Preferred Alternative and all Throat Area Variations will require Chapter 91 authorizations for work within filled tidelands and flowed tidelands of the Charles River. Filled tidelands are former submerged lands and tidal flats that are no longer subject to tidal action due to the presence of fill. Flowed tidelands include the area of the Charles River located below, or riverward, of the OHW (elevation 2). The installation, removal and replacement of stormwater discharge pipes along the Charles River will require authorization for work within flowed tidelands. The 3K-HV and 3K-AMP Variations will require Chapter 91 authorization for roadway components within filled tidelands only, as other than the discharge pipes, no work is proposed within flowed tideland located riverward of OHW.

The 3K-ABC Variation requires the placement of fill and a retaining wall within the flowed tidelands located below OHW. The PDW Path portion of the Throat Area Variation layout will extend 7 feet riverward beyond elevation 2. Table 1.2-1 shows that **the 3K-ABC Variation will have the greatest impacts to Chapter 91 and Article 97 lands, followed by 3K-AMP, with 3K-HV having the least impacts.**

Neither the rail operations nor West Station will alter or impact state and federal wetlands and waterways.

1.5.13 Floodplain

With the exception of the stormwater discharge pipes associated with the stormwater management component of the Project, the I-90 Urban Interchange Preferred Alternative will not be located within the 100-year flood zone (below El. 4 NAVD88). There will be no impacts to the 100-year flood zone.

With the exception of the stormwater discharge pipes described above, Project elements associated with the 3K-HV and 3K-AMP Variations will not be located within the 100-year flood zone. **There will be no impacts to the 100-year flood zone associated with the 3K-HV or 3K-AMP Variations.**

Impacts to the 100-year flood zone under the 3K-ABC Variation, will include minor impacts from the stormwater discharge pipe work. In addition, portions of PDW Path will be supported by a retained fill section below elevation 4, resulting in the loss of flood storage volume or flood storage capacity. In accordance with the MA Wetlands Protection Act (MA WPA), compensation for loss of flood storage must be a volume not previously used for flood storage and incrementally equal to the volume of flood water at each elevation. The volume must have an unrestricted hydraulic connection to the same waterway and within the same reach of the river.

1.5.14 Navigation

None of the work associated with construction of the I-90 Urban Interchange Preferred Alternative will result in permanent adverse impacts to navigation in the Charles River. The navigable waterway is located below elevation 2 and identified as OHW under State Chapter 91 Waterways and WUS under federal statute. No portion of these Project components will be located within the navigable waterway. **Construction of the 3K-HV and 3K-AMP Variations will not result in permanent adverse impacts to navigation in the Charles River.** No portion of the Project will be located within the navigable waterway. **The 3K-ABC Variation will be located within the navigable waterway riverward of OHW/WUS.** The introduction of a wall that will extend up to 7 feet into the navigable waterway beyond OHW/WUS is not expected to interfere with navigation in the waterway. The construction of the retaining wall and fill may be performed from the waterway by barge and associated equipment requiring temporary occupation of portions of the navigable waterway. Temporary closures of portions of the river may be required for safety purposes during construction.

1.5.15 Fisheries

None of the work associated with construction of the I-90 Urban Interchange Preferred Alternative, rail operations or West Station will result in permanent adverse impacts to fisheries in the Charles River. For the Throat Area Variations, **neither the 3K-HV Variation nor the 3K-AMP Variation will impact the Charles River fisheries resources.**

The 3K-ABC Variation may result in impacts to fisheries within the Charles River. The PDW Path within the river will impact the banks underlying the anadromous/catadromous fish run and associated fisheries habitat provided by the vegetated bank.

Construction of the retaining wall and associated fill under the 3K-ABC Variation will require in-water work that may result in temporary impacts to fish habitat during construction. To avoid disturbance to the anadromous fish run, restrictions on the time of year of construction activity will be required. Permanent impacts to fish habitat will result from the elimination of feeding areas for anadromous/catadromous fish during transit as they migrate up and down stream.

1.5.16 Threatened and Endangered Species/Wildlife

The entire Project, with the exception of the area east of SFR along the Charles River, is a highly disturbed transportation corridor. As such, impacts to wildlife from Project will be minimal. In addition, **the Project will have no impact on federal or state Threatened and Endangered species as none are present in the Project Area.**

1.5.17 Stormwater Management and Water Quality

There are a number of owners/operators of the stormwater management system throughout the Project area: MassDOT, MBTA, City of Boston (via Boston Water and Sewer Commission or BWSC), the DCR and Harvard University. The approach to stormwater management and water quality will be based on the owner/operator design and review requirements, standardized details and specifications, and construction and maintenance protocols. Although the limits of jurisdiction among these entities will be distinct and defined by property rights that will be established as part of the Project design process, the attainment of stormwater management goals will be evaluated and measured on a Project-wide basis without regard to proposed jurisdictional boundaries.

For all Project elements, the stormwater management system will be designed to meet MassDEP Stormwater Management Standards for both management and quality of stormwater discharges. The MassDEP Stormwater Management Standards require specific control measures for stormwater discharges that improve the quality and decrease the quantity of stormwater generated from impervious surfaces before entering nearby wetland resources and water bodies. The standards require that the total stormwater volume and velocity (flow rate) is slowed and as much stormwater is allowed to naturally soak into the ground, which will in turn, allow for pollutants to be removed from the stormwater.

Stormwater management and the type of treatment system varies with each Throat Area Variation. The 3K-HV Variation will **provide sufficient shoulder width** so stormwater runoff and ice hazards **will not encroach into adjacent travel lanes.** There will also be space under the viaduct for the installation of stormwater Best Management Practices (BMPs), which will help contribute to this variation's ability to **exceed the targeted phosphorus load reduction of 64%**.

Both the 3K-AMP and 3K-ABC Variations will include narrow shoulders with **inadequate width to safely contain stormwater flow in the shoulders.** This will result in gutter flow spreading into the adjacent travel lanes and leading to potential safety issues (hydroplaning vehicles). These variations will depress a section of I-90 (3K-AMP deeper than 3K-ABC) such that the proposed **drainage collection system will be below the water elevation of the Charles River and will require pumping.** Because the depressed section will be below groundwater elevation, anti-buoyant concrete slabs and walls will be needed to prevent groundwater intrusion into the highway pavement section. There will also be less treatment area available with these variations, and the targeted **phosphorus load reduction of 64% will not be achieved.**

1.5.18 Utilities

New utility infrastructure to service the Project will be installed within the new highway and street system. However, **several large water and sewer mains that currently traverse the Project Area will remain in their existing locations.** These facilities are owned by the MWRA or BWSC. Existing communication conduits on the I-90 viaduct will be relocated underground and adjacent to the railroad tracks, crossing to the northerly side of I-90 at the Cambridge Street bridge to reconnect to the existing conduits to the west of the proposed pedestrian/bicycle bridge. The proposed underground relocation will avoid repetitive and costly temporary moves on the viaduct as it is constructed in stages.

In the Throat Area, several viaduct foundations required for the **3K-HV Variation must span over the existing 60-inch MWRA sewer, but direct impacts can be avoided.** The 3K-AMP Variation will place the interstate travel lanes at grade over the same sewer, thereby impacting access to it and impacting interstate operations and safety when access is required. The 3K-ABC Variation, which will also place interstate travel lanes at grade, will have similar impacts. **The 3K-AMP Variation, due to a lower rail and interstate westbound profile, will impact MWRA's encased 64-inch water main** that crosses the Throat Area. A complete relocation of the pipe to a deeper alignment will be needed. **Both the 3K-AMP and 3K-ABC Variations will impact the existing stormwater pump station** located at the easterly abutment of the viaduct, requiring its reconstruction outside the area and installation of new utility support lines.

1.5.19 Climate Change Vulnerability and Resiliency

The Boston Harbor Flood Risk Model (BH-FRM) results for existing conditions predict no chance of flooding in the Project Area outside of the banks of the Charles River. The BH-FRM results for 2030 conditions, five years after the 2025 Opening Year, also predict no chance of flooding in the Project Area outside of the banks of the river.

The results for 2070 conditions predict flooding outside of the Charles River, primarily between the railyard south of River Street, north to Western Avenue, extending as far west as Travis Street. Additional smaller areas of inundation occur along SFR and the PDW Path (north of BU's Nickerson Field and College of General Studies). **Flooding in 2070 will not threaten I-90 until the highway meets grade near the BU Bridge. The 2070 maximum water surface will be above the road surface elevation for SFR. The rail operations and West Station will not be vulnerable to flooding during the 1% (100-year) flood event.** For all three Throat Area Variations, in 2070, the southeastern portion of the at-grade SFR and the PDW Path in the vicinity of the BU Bridge will be vulnerable to flooding during the 1% (100-year flood event).

1.5.20 Oil and Hazardous Materials

Oil and hazardous materials (OHM) will be encountered at varying concentrations across much of the Project Area due to past commercial, industrial and transportation-related activities. Seventy-seven Massachusetts Contingency Plan (MCP) disposal sites have been identified within the Project Area. Most of these have reached regulatory solutions with Permanent Solutions. However, nine disposal sites are listed as either still active or currently under Temporary Solution Status within areas that may potentially be impacted by anticipated highway construction activities.

Under the I-90 Urban Interchange Preferred Alternative and all Throat Area Variations, Project planning will incorporate knowledge of known MCP-related site conditions with respect to soil and groundwater management and also worker and neighborhood health and safety during construction. Re-use of soil on site will be the preferred option for materials management. **Soil or groundwater with known OHM-impacts encountered during construction will be managed in accordance with the applicable state and federal regulations. The planning process will include development of mechanisms and protocols to manage OHM in accordance with the MCP and related regulations and policies.**

All disposal sites located within BPY and the Throat Area have achieved permanent regulatory closure. Two of the closed disposal sites located within the BPY and Throat Area have achieved permanent regulatory closure through a Permanent Solution with Conditions. Construction activities must comply with these conditions and with MCP practices and policies related to implementation and management of these conditions, including materials management and building construction.

1.5.21 Construction Impacts

Proposed improvements associated with the I-90 Urban Interchange Preferred Alternative (2040 Full Build) and the three Throat Area Variations will be constructed in several stages.

The scope of work included in each stage will be based on maintaining three available travel lanes in each direction on I-90 and two available lanes in each direction on SFR at all times to accommodate peak traffic flow. Selective phases of the work may require limited shoulder or lane closures during off-peak hours. A minimum of one Worcester Main Line track will be required to maintain MBTA commuter rail service at all times. Construction activities may impact the ability to operate the commuter rail during periods. Overhead work required above operating tracks and deep excavation work in tight work zones may restrict track operations. Construction staging for each variation currently provides one Worcester Main Line track throughout construction; however, further engineering will be required to ensure prolonged closures will not be necessary for the 3K-AMP and 3K-ABC Variations. **The 3K-AMP and 3K-ABC Variations will require the closure of the GJR for a minimum of four and three years, respectively. The 3K-HV Variation will result in short-term closures of the GJR.** Pedestrian and bicycle facilities along Cambridge Street will be maintained at all times while PDW Path access depends on the Throat Area Variation, where sections may be detoured and/or closed for safety purposes.

1.5.22 Construction Phasing and Costs

MassDOT anticipates constructing the Project in three distinct phases. By phasing the core elements of the Project, MassDOT believes that future key elements, such as West Station, may be better integrated into the future development buildout as ridership demands increase. MassDOT is also deferring construction of West Station partly in recognition of the newly opened Boston Landing Station. This station, which is located in Allston about 3/4 miles from the proposed West Station, is providing Allston residents with commuter as well as existing MBTA bus service (Route 64) serving Allston and Cambridgeport via Cambridge Street. MassDOT believes that with the multi-modal service offered at Boston Landing Station and the improvements to the Franklin Street pedestrian bridge crossing, residents of Allston and Lower Allston will be well served by public transit and non-motorized options until further development demands another station. The core elements to be built in each of the three phases are summarized below.

Phase 1

The initial phase will be constructed utilizing a design-build delivery system, with construction projected to be substantially complete by the year 2025. This phase focuses on addressing the structurally deficient viaduct and other needed interchange improvements. The I-90 mainline will be reconstructed and realigned to the south, and a new on- and off-ramp system will be built connecting to a network of new urban streets. The street network will include a series of north-south connections to a reconstructed Cambridge Street as a Complete Street. It will also include a new east-west street from North Harvard Street to SFR that provides dedicated space for a robust, two-way shared use path.

SFR will be realigned further away from the Charles River and constructed in a depressed "boat section," allowing for a direct at-grade bicycle/pedestrian connection to the PDW Path and new on- and off-ramps. Reconstruction of the Franklin Street pedestrian bridge over I-90 and construction of a new pedestrian/bicycle connection (bridge over rail yard) between Malvern Street and the reconfigured interchange will also be included. Under the 3K-HV and 3K-ABC Variations, Phase 1 will include improvements to four existing yard tracks within the MBTA easement area to provide layover capacity for eight train sets. Under the 3K-AMP Variation, the four existing yard tracks will be displaced by the retained earth structure carrying the GJR tracks between the rail viaduct and existing grades in BPY. There will be no layover yard at BPY under 3K-AMP during this phase. Finally, noise barrier walls and improvements to the existing four layover tracks will be completed.

Phase 2

The second phase of the Project, which for the purposes of this DEIR is assumed to be completed in advance of 2040, looks to address the need for a fully functional and modern layover and light maintenance facility for the MBTA. For the 3K-HV and 3K-ABC Variations, Phase 2 will include the construction of four additional layover tracks and associated switches and yard ladders to the north of the MBTA easement area, increasing total storage capacity to 16 train sets. 3K-AMP will add these four tracks, providing for a total storage capacity of eight train sets under this variation. Construction of other ancillary improvements, including utilities, paved surfaces, crew quarters and storage sheds, will be provided.

Phase 3

The third phase of the Project will include the construction of West Station and related improvements, which for the purposes of this DEIR, will be assumed to be built no later than 2040 to respond to future ridership demand.

During the phase, additional main line tracks and other signal improvements will be built. West Station will have two or three platforms served by four tracks; a multi-modal bus concourse above the train tracks connecting to the reconfigured I-90 interchange; and dedicated pedestrian/bicycle connections to/from the Station to points north and south. Four layover tracks will be removed to provide space for the station and platforms, reducing total layover capacity from 16 train sets to eight train sets. This phase assumes the balance of the street network to the north of Cambridge Street and Stadium Way Connector will be constructed by Harvard University.

Based on the conceptual engineering completed to date, Table 1.5-1 summarizes estimated costs and construction durations.

Table 1.5-1: Construction Cost and Duration Summary

	Throat Area Variation		
	3K-HV	3K-AMP	3K-ABC
Estimated Construction Cost	$1.05 B	$1.25 B	$982.9 M
Estimated Construction Duration	6.5 years	8 years	6.5 years

Estimated costs include: base construction items, contingency, and escalation.

1.5.23 Environmental Justice

The identification of Environmental Justice (EJ) populations is based on census data indicating block groups with households who meet one or more of the following EOEEA Policy criteria:

- The median annual household income is at or below 65% of the statewide median income ($45,908) for Massachusetts ($70,628 in 2015);
- 25% of the residents are minority;
- 25% of the residents are foreign born; and
- 25% of the residents are lacking English language proficiency, defined as households in which no one aged 14 and over speaks English only or speaks English "very well."

U.S. Census block group data indicate that almost all the Boston, and some of the Cambridge blocks, contain EJ populations – the majority because of minority households, and a substantial area in Boston meeting both income and minority criteria. None are identified as being isolated because of a lack of English language skills in the household.

None of the impacts of the Build or No Build Alternatives will result in disproportionately high and adverse human health or environmental effects to environmental justice populations. In fact, the proposed alternatives will likely provide benefits to this community as congestion at the interchange and the adjacent street network will be reduced.

1.6 Summary of Mitigation

A detailed description of the mitigation measures proposed for the environmental impacts identified appears in Chapter 7. In summary, the key mitigation measures are:

- Construction-term measures to prevent erosion, minimize sediment transport and prevent pollution from entering the Charles River, implemented through a Stormwater Pollution Prevention Plan;
- Traffic Monitoring Program, Transportation Demand Management, Temporary Traffic Control Plan, and Real Time Traffic Management (RTTM); Construction Mitigation-emissions Control Plan to address fugitive dust, construction equipment and vehicle exhaust, and potential traffic disruption and congestion;
- Construction of noise walls at Allston Village and in the Pratt Street and Wadsworth Street area, between Cambridge Street and Everett Street, between Everett Street and Market Street, and in the vicinity of Nickerson Field;
- Mitigation for alterations to Charles River associated with 3K-ABC Variation;
- Potential imposition of a time-of-year restriction during in-water work to avoid seasonal migration, spawning, and impacts to young fish to avoid nursery habitat impacts (required under the 3K-ABC Variation only); and
- Compliance of all OHM mitigation work, whether conducted in rail or highway sections, with the applicable regulatory framework, primarily the MCP.

2 Purpose and Need

The Purpose and Need Statement of a project identifies the need for the proposed improvements and provides the reasoning for how the project addresses the identified problems, issues and concerns. This Purpose and Need Statement serves as the foundation for the I-90 Allston Interchange Project and provides the principal information in determining the range of alternatives under consideration. Any alternative that fails to meet the Project's Purpose and Need can be dismissed by the Massachusetts Department of Transportation (MassDOT) and/or the Federal Highway Administration (FHWA).

The Project Purpose defines the transportation problem and presents the positive outcomes intended. The Project Need provides data to support the problem and evidence that the problem exists. There are also Goals and Objectives associated with a project. Goals and Objectives are desired outcomes, not central to the Purpose and Need, that may result in benefits such as improved air quality or economic development opportunities.

2.1 Project Purpose

The Project Purpose defines the transportation problem and presents the positive outcomes intended.

2.1.1 Interchange

The purpose of the highway improvements is to replace the functionally obsolete, structurally deficient I-90 viaduct with a safer facility, and to reduce congestion and improve mobility in the surrounding area by providing a new interchange with a network of ramps and local street connections. In addition, the purpose is to realign and redesign a segment of the highway to optimize operations associated with the recent toll booth demolition and All Electronic Tolling (AET) improvements.

EXIT 20
Brighton
Cambridge
1/2 MILE
U-TURN TO
Boston
EXIT ONLY

Newly constructed I-90 AET Gantry

The existing I-90 Allston interchange is a significant part of the regional and local infrastructure, carrying approximately 154,000 vehicles on a typical weekday (two-way volume: eastbound and westbound), and connecting Logan Airport, I-93 and downtown Boston with areas to the west, with connections to I-95 and I-495. The intersection of the I-90 ramps with Cambridge Street and SFR is severely congested throughout the morning and the afternoon. The existing I-90 viaduct, the elevated section of highway that runs from approximately Commonwealth Avenue in the east to the former Allston toll plaza in the west, is deteriorating. It is structurally deficient and nearing the end of its useful service life. Continued maintenance of the viaduct will be increasingly expensive, and the lifecycle costs associated with operating the structure will soon outweigh the lifecycle costs of replacement. The viaduct must eventually be replaced.

2.1.2 Rail Operations

The purpose of the Project's rail operations improvements is to meet the MBTA's current deficit of layover capacity to support its south side commuter rail operations, and to maintain and enhance operations along the Worcester Main Line and the Grand Junction Railroad (GJR). An integral component of South Station operations is the continued ability to access and use rail yards near South Station to store, service, inspect and conduct minor repair activities when trains are not in service. The rail operations component of the Project provides layover area to support these critical activities. Upon completion of an extensive alternatives analysis for the South Station Expansion (SSX) project, MassDOT identified Beacon Park Yard (BPY) in Allston as its preferred location to meet the Massachusetts Bay Transportation Authority's (MBTA's) current deficit of layover capacity to support its South Side commuter rail operations.

The purpose of the rail operations improvements is also to enhance flexibility and reliability along the Worcester Main Line through the Project Area. The Project will add track cross overs and signal controls that will support operational flexibility by allowing trains to maneuver between the Worcester Main Line tracks and the rail yard, and between both the Worcester Main Line/rail yard and the GJR tracks. The rail operations improvements will preserve and enhance operations along the GJR, a critical connection between the MBTA's South Side commuter rail system and the North Side system. These improvements will result in more efficient and reliable train service with more operational flexibility, including the ability to allow express trains operating between Boston and Worcester to bypass a local train stopped at either Boston Landing Station or West Station.

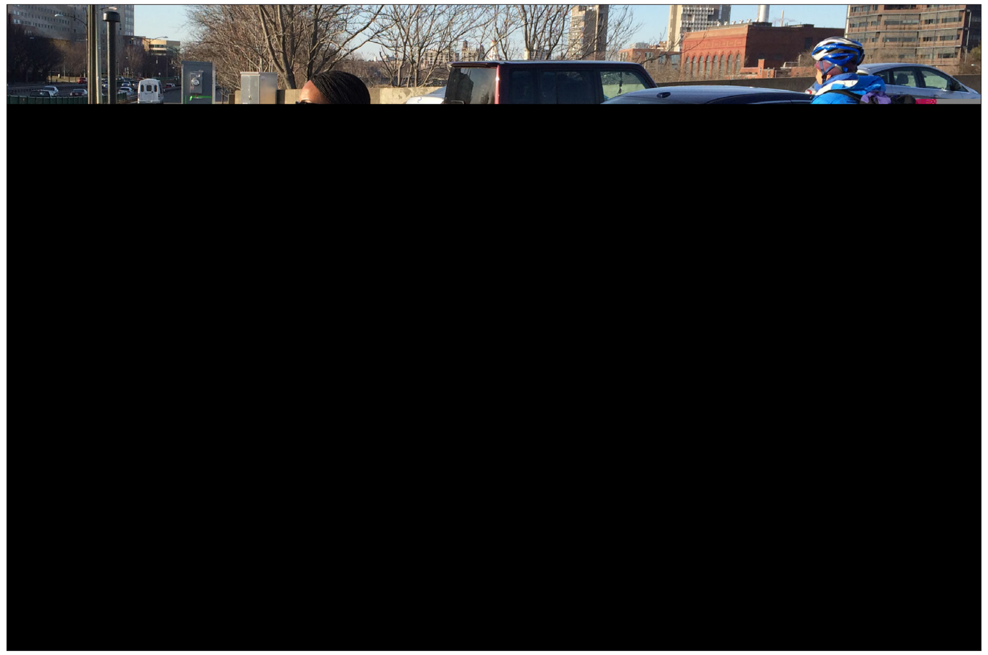
2.1.3 West Station

The purpose of West Station is to provide a neighborhood-oriented, multi-modal commuter rail station in an area surrounded by higher education facilities and residences with transit hub connections for rail and bus riders, bicyclists and pedestrians.

The MBTA Green Line "B" Branch provides the Allston/Lower Allston neighborhood with service through several stations along Commonwealth Avenue, and the MBTA bus network provides service throughout the neighborhood. However, access to these transportation modes is dispersed and commuters do not have a centralized transit hub from which multiple modes operate. Commonwealth Avenue and North Beacon Street serve as a strong linear transportation corridor with MBTA Green Line and bus access. They do not, however, provide a sense of destination or origin from which system users would orient their trips using a variety of transportation modes including heavy rail, light rail, cycling and walking.

Although the Framingham/Worcester MBTA commuter rail line runs through the Project Area, the adjacent neighborhood and higher educational institutions lack a station stop or transit hub that provides bus, rail, bicycle and pedestrian multi-modal connections to other transportation modes located to the east and west. West Station will provide direct access to the existing MBTA commuter rail service. It will also support multi-modal access by providing multiple shared use (bicycle and pedestrian) path connections to the surrounding street grid and the Dr. Paul Dudley White Bike Path (PDW Path). Without centralized options for accessing regional and local transit, the Allston/Lower Allston neighborhood will not be able to fully support the adoption or growth of multi-modal or non-vehicular transportation.

Harvard University Beacon Yards, LLC, the owner of the property where West Station will be located, plans to develop parcels made available by the realigned I-90 interchange, including future air rights development to be built above BPY and West Station. As this newly vacated area develops, public transportation demand will continue to rise to support new residents, businesses, university facilities and other neighborhood amenities.



Extensive pedestrian and bicycle improvements are an important component of this Project

2.1.4 Pedestrian and Bicycle Improvements

The purpose of adding dedicated pedestrian and bicycle infrastructure is to provide additional, safe non-motorized modes of transportation that will serve the surrounding neighborhood and future development district. MassDOT is developing the Project in a manner to further the following general goals: to reduce greenhouse gas (GHG) emissions, promote the healthy transportation options of walking, bicycling and public transit, and support Smart Growth development. In addressing the interchange needs, the Project presents a unique opportunity to bring rail and active transportation improvements to the area while incorporating future needs of the landowner (Harvard University) and creating a renewed sense of place in the community.

WESTERN AVENUE
KLIN STREET
N HARV
WINDOM S
Traffic/Safety

[redacted]

Project Need components

2.2 Project Need

A number of factors establish the Project Need including:

- **Safety:** Ability to correct existing or potential safety hazards/accident rates
- **Capacity:** Ability of existing facility to meet present and projected demands
- **System linkage:** Ability to provide a “connecting link” and fit into the regional and local transportation system
- **Transportation demand:** Relationship to a statewide plan or adopted urban transportation plan
- **Social demands or economic development benefits:** Relationship to land use plans, recreation facilities, and economic development/land use changes that indicate the need to improve or add to the highway capacity
- **Modal interrelationships:** Ability to interface/complement airport, rail, port and mass transit facilities
- **Roadway deficiencies:** Ability to correct substandard geometrics, load limits, inadequate cross sections and high maintenance costs
- **Rail operations:** Ability to support MBTA commuter rail operations now and in the future
- **Multi-modal access:** Ability/need for West Station to maximize potential use of multiple public transportation services, compared to vehicular-only travel

2.2.1 I-90 Interchange Need

The existing I-90 interchange dates from the original construction of the Boston Extension of I-90 in the 1960s. The conditions in the interchange, like much of the Boston Extension, do not meet current interstate highway design standards. I-90 carries four travel lanes in the eastbound direction and four travel lanes in the westbound direction outside of the interchange or ramp terminals. Within the interchange (between ramp terminals), the number of lanes in the eastbound direction and in the westbound direction decreases to three. I–90 westbound traffic currently passes between the I-90 eastbound exit bridge piers, located just west of the former I-90 toll plaza that was removed in October 2016.

The westbound I-90 exit ramp to Cambridge Street carries two travel lanes, but the exit from I-90 is inadequately designed, and as a result, exacerbates safety hazards. Specifically, I-90 provides no separate lane for decelerating traffic on the approach to the exit, which violates American Association of State Highway and Transportation Officials (AASHTO) design requirements. Without the deceleration lane, I-90 is operationally deficient and unsafe at this location. A two-lane exit requires two travel lanes on the main highway that safely diverge traffic, without conflict, with through traffic. I-90 westbound on the exit approach carries only four travel lanes, and this leads to a crossing maneuver conflict between the right-most of the four I-90 westbound through traffic lanes with the left-most of the two exiting lanes.

The entrance ramp that originates from Cambridge Street and connects to I-90 eastbound operates as a two-lane ramp, but the entrance ramp to I-90 does not meet current design standards, and as a result, increases safety hazards. Specifically, the left-most of the two ramp lanes entering I-90 connects directly with the right-most of the three I-90 eastbound lanes, leading to a conflict between entering and through traffic. This same design deficiency occurs at the I-90 westbound entrance ramp. The I-90 eastbound exit destined for Cambridge Street diverges from the I-90 travel lanes on the left side. This design is not recommended by AASHTO because the exit is made from the high-speed travel lane on the left, which introduces a safety hazard due to the differential in travel speeds. This safety concern is minimized with a design that positions the exit that diverges from the slow speed lane on the right.

The left and right shoulder widths, and the lateral offsets between the shoulders and adjacent features higher than 6 inches in elevation on I-90, are not compliant with current AASHTO interstate requirements. Taken together, the interchange is representative of outmoded design standards that contribute to significant safety deficiencies and cannot be effectively addressed except by complete reconstruction.

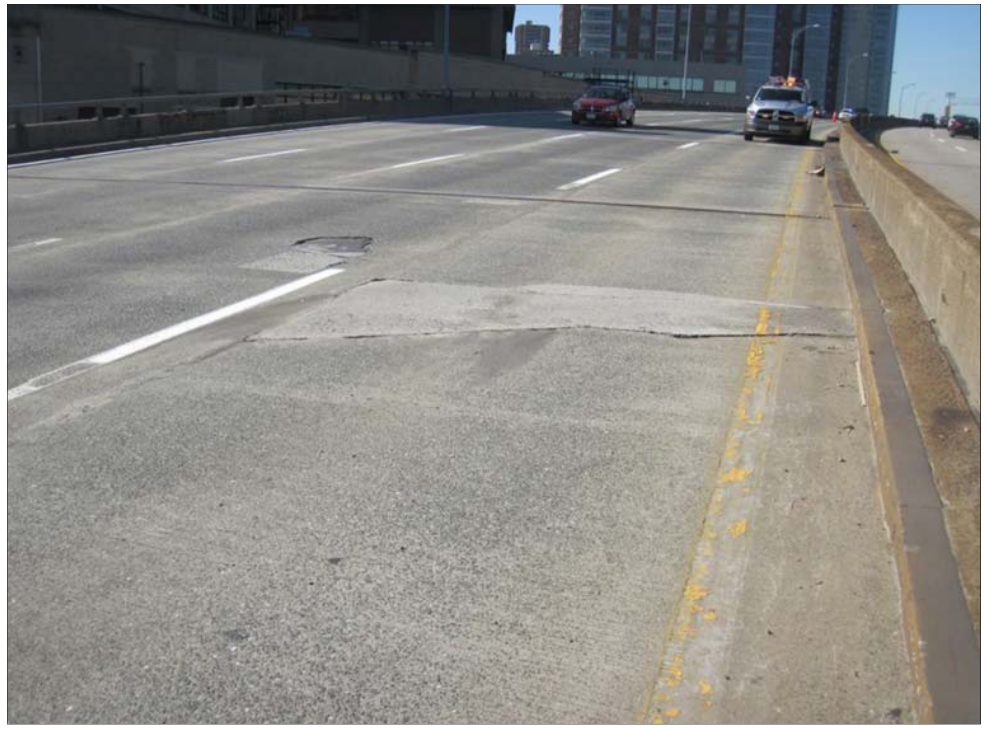
2.2.1.1 Viaduct

The eastern portion of I-90 is an elevated viaduct spanning over the rail lines. Crash data for the most recent three-year period available (2013-2015) indicates the viaduct section of the Project has an average crash rate of 1.08 crashes per million vehicles miles traveled (MVMT), which exceeds the statewide average for urban interstates of 0.58 crashes per MVMT. The existing viaduct curb-to-curb width is 48 feet and provides four 11.5-foot-wide lanes and 1-foot-wide shoulders on average, based on record plan and aerial survey data. In winter conditions, the existing viaduct pavement width provides no accommodation for snow storage, and this leads to several adverse impacts. Snow plows pushing snow to the right, out of the travel lanes, are unable to remove snow completely from the low speed (right-most) travel lane because of some unavoidable sloughing of the snow back on to the pavement. The existing bridge rails create a barrier against which the snow piles up and sloughs back to the pavement, reducing travel lane width. Puddling from snow melt occupies portions of the travel lane, and overnight freezing creates additional hazards within the lanes and at catch basins. In addition, snow clogs the deck drains, preventing the snow melt from quickly moving off the pavement and creating a potential icing problem that further degrades safety.

In 2014, an inspection of the viaduct was performed. The condition of the viaduct requires either significant repair or replacement. The following is a summary of the overall condition of the I-90 viaduct based on the resulting report and field observations.

Deck

The exposed concrete deck is in poor condition with extensive areas of cracking, potholes and patched areas. Many of the patched areas are failing, with an uneven surface and depressions. The concrete joint headers, located at the bridge deck joints at the piers, have significant concrete spalling (crumbling or flaking) with exposed steel reinforcement. Also visible are scattered spalls and deterioration (corrosion) of the metal stay-in-place forms on the underside of the deck, in all areas except the deck overhangs and under the median.



The I-90 deck has extensive areas of cracking, potholes and patched areas

Superstructure

The longitudinal steel stringers (beams) that support the concrete deck have a failing paint system that is faded and chalky, with areas of peeling paint. There are also areas of light to moderate rusting along the bottom of most beams. The outermost beams, and the beams under the viaduct median, have areas of localized corrosion. The bottom portions of these beams have lost some of the steel section, and steel is flaking off or delaminating (hollow areas) due to rusting and corrosion. The loss of steel section reduces the structural capacity of these beams to support applied loads.

The steel cross girders transfer the loads from the longitudinal beams to the concrete column pier foundations. These members are considered "fracture critical" members because they are steel members with no redundancy. Two cross girders comprise the pier cap at each pier/foundation location. Many of the cross girders have rusting, corrosion and steel section loss. This deterioration is primarily located on the side of each cross girder that is exposed to the open deck joint, above where water (and salt) runoff from the roadway. Many cross girders have been reinforced with new steel plates but continue to deteriorate with new corrosion and loss of steel section.

In summary, the concrete bridge deck is in poor condition with extensive areas of deterioration. The majority of the beams supporting the bridge deck are in fair to satisfactory condition, with more advanced deterioration at locations of higher exposure to water leakage from the roadway above, such as those beams located under the median. The steel cross girders that form the pier cap are in fair to poor condition. Nearly all of these cross girders have measured loss of steel section along portions of their length. A number of girders have been repaired/strengthened over the years.

Underside of I-90 viaduct

Substructure

Most of the piers are comprised of individual concrete columns that support the steel cross girder pier caps, as previously described. The majority of columns have widespread deterioration. This deterioration consists of areas of map cracking (intersecting cracks), concrete delamination (hollow areas), rust and water staining, and concrete spalling with areas of exposed reinforcement. Many of the columns have also been previously repaired (patched). Many of these repaired areas are failing with map cracking and rust staining. There are also several columns that have spalling at the top of the column. In some cases, these spalls extend to the bearings of the steel cross girders and have caused partial undermining of the bearing base plate. The line of columns along the south edge of the viaduct is in the worst condition.

The concrete abutments at each end of the bridge are generally in satisfactory condition. The abutments have some minor cracking with localized hollow areas. There are also scattered spalled areas just below the armored deck joints.

Deteriorated concrete column supporting the I-90 viaduct

2.2.1.2 Other Major Roadways

The intersection of Cambridge Street with Soldiers Field Road (SFR) averages 55 accidents per year and is within the top 5% of crash locations in the Boston region. The correction of this substandard intersection will improve safety and reduce traffic on Cambridge Street by providing multiple local roadway connection points that disperse traffic flow.

2.2.2 Rail Operations Need

The Project will help to fulfill two essential railroad operational needs:

- Complete construction of new track work that will expand train capacity on the Worcester Main Line, and implement signal and control upgrades that improve current and future operations for both the Worcester Main Line and the GJR
- Store commuter rail trains during the midday layover period to address an existing and growing deficiency in layover spaces on the MBTA's South Side system

The MBTA's Worcester Main Line ridership ranks among the highest of its commuter rail routes. The MBTA has begun to address capacity issues by constructing a second mainline track through the Project Area (an action that was originally to be part of the Project). Work remaining includes construction of track switches that allow trains to maneuver between tracks to the east (CP-3) and west (CP-4) of the rail yard, including signals and system controls that facilitate these moves.

With four connected tracks running in parallel through most of the Project Area, the MBTA will also gain the potential to increase service capacity and decrease travel times. The MBTA has been seeking the means to enhance the service by commencing express train ("Heart to Hub") service between Worcester and Boston. As many as 1,500 passengers board the train in Worcester for the daily commute into Boston. With numerous local stops between Worcester and Boston, travel times can be 70 minutes or more for the 45-mile journey. Measures to improve service to Worcester have the potential to increase ridership and take more cars off the highway system.

The Project's improvements to rail operations are also needed to maintain and enhance operations along the GJR. The GJR diverges from the Worcester Main Line tracks within the Project Area, with one track continuing to the north across the Charles River to destinations that include the MBTA's Commuter Rail Maintenance Facility/Boston Engine Terminal (BET) where the entire MBTA commuter rail fleet is brought for major repair and rehabilitation. It is also a key freight connection serving the Chelsea Produce Market. The GJR is the only link within the Metropolitan area between the MBTA's South Side and North Side systems. The Project will also improve GJR operations by using the proposed layover yard to turn trains between the South Side tracks and the GJR tracks. Currently, these turns are made by pulling South Side trains over Worcester Main Line tracks westerly past the Project Area to turn on a tail track by the new Boston Landing Station before returning through the Project Area to reach the GJR.

Layover facilities are integral to the safe and efficient operation of the MBTA's commuter rail system. For more than a decade, the MBTA has expanded commuter rail service while coping with inadequate mid-day layover capacity. Layover facilities serve essential functions. They are used to store trains off active tracks, and they are also used as service areas to perform running repairs and light maintenance.

The SSX project documents fully described the need for additional layover tracks on the MBTA's South Side commuter rail. The MBTA documented the existing layover deficit such that it leads to six trains running empty along the tracks to avoid conflict with continuing midday service operations. Projections show that the MBTA would have a deficit of up to 33 layover spaces by the time that the SSX project is fully implemented in 2035. In addition to the net deficit between existing capacity and future needs, MBTA also expects the need to vacate three or more Amtrak-owned tracks it occupies because these tracks are too short for future MBTA train sets, lack electric plug-ins needed to limit engine idling, and may be needed in the future by Amtrak for its own needs. The SSX project identified BPY as one of three preferred locations to construct layover tracks because of its available space, proximity to South Station, and its position on the western branch of the South Side system. Two other locations, Widett Circle in South Boston and Readville Yard 2 in Hyde Park, round out the SSX preferred alternatives. None of the preferred locations would be large enough to house the entire layover fleet and they are not interchangeable as each would provide slightly different utility to support MBTA's revenue service movements. Of the three locations, only BPY is currently usable by right.

The SSX Draft Environmental Impact Report (DEIR) selected BPY as the preferred location for layover to support South Station-based operations heading west. As South Station has two approach routes, increasing the layovers to the west of the terminal will make railroad operations at the station more efficient and better able to accommodate future service growth. By creating a layover network that splits the layover function to correspond with revenue service movements, and by minimizing the number of deadhead moves through South Station to run trains that could remain on the west side, operations will be improved. Providing midday layover on the west side of South Station will decrease the distance and number of train movements to reach a layover yard and will address both a current and future need. This will lead to a reduction in energy consumption from locomotives, less wear and tear on rail vehicles, and an accompanying reduction in greenhouse gas (GHG) emissions. The proposed layover yard will also help reduce the considerable costs associated with the empty moves. To meet potential future layover needs of different vehicle types, the rail yard will provide critical capacity to accommodate future service increases and fleet expansions.

2.2.3 West Station Need

The proposed West Station will maximize potential use of multiple public transportation services, compared to vehicular-only travel. Its proximity to newly developable areas, historic neighborhoods, and the I-90 interchange makes this location well situated to address numerous transportation needs and provide connectivity between modes of travel including non-motorized travel and existing MBTA services. The station will offer active (or non-motorized) transportation modes. It will support an increased demand for transportation from existing users to the south (primarily the Boston University (BU) campus), and future developed parcels to the north of the site. The developable parcels from the realignment of I-90 would otherwise add stress to the existing roadway and highway network. The station will also accommodate general increases in transportation demand from background local population growth. The proposed location presents an opportunity to construct a neighborhood-oriented, multi-modal commuter rail station within a quarter mile of the Green Line "B" branch and in the vicinity of three MBTA local bus routes, and integrate rail service with a bus station.

2.2.4 Pedestrian and Bicycle Need

Pedestrian and bicycle facilities, accommodations and related infrastructure are in need of improvement in many locations within the Project locus. There are missing and/or non-compliant pedestrian curb ramps, improperly functioning and/or missing pedestrian signal equipment, very long crosswalks at the ramp terminals at Cambridge Street contributing to safety concerns, and sections of the Paul Dudley White Bike Path (PDW Path) lacking adequate width for shared pedestrian/bicycle use. There is also a functionally obsolete pedestrian footbridge over I-90, the Franklin Street footbridge, that does not meet accessibility requirements. According to the most recent inspection report (August 27, 2015), the bridge, built in 1964, is generally in fair condition, with deficiencies rated from minor to severe. Despite being difficult to use, this structure is a major cycling and pedestrian link between Allston and Lower Allston. Its reconstruction has been identified as a major community interest tied to this Project.

Deteriorated sidewalk and non-existent pedestrian ramp

While MassDOT is addressing some of these needs and the City of Boston has plans for interim improvements at certain locations along Cambridge Street, the Project will address the needs in a much broader context. The new urban interchange and street grid system will provide for dedicated pedestrian and bicycle infrastructure that offers tangential benefits including provisions for additional east-west and north-south connectivity through the Project Area.

2.3 Goals And Objectives

Goals and Objectives associated with a project are desired outcomes, not central to the Purpose and Need, that may result in benefits such as improved air quality or economic development opportunities.

2.3.1 Interchange Goals and Objectives

The Goals and Objectives associated with the I-90 interchange reconstruction include: replacing a critical infrastructure element that is in substandard condition; providing infrastructure to support active transportation modes and economic development within the Project Area; improving air quality by eliminating queues associated with ramp congestion and idling at intersections; providing access for alternative modes of transportation in the Project Area that are currently constrained or non-existent; and minimizing impacts to the environment both during construction and in the final condition.

Several other goals and points of agreement between the Task Force and MassDOT specific to the interchange were articulated during Task Force meetings. They include: designing the ramp and street network in a manner that helps reduce cut through traffic in the adjacent neighborhoods; designing Cambridge Street as a “Complete Street;” and providing a network of streets that helps support a framework for future development opportunities. Many of these goals are consistent with MassDOT policy, as the planned interchange improvements will help reduce GHG emissions and support Smart Growth development.

MassDOT is also working with Boston Planning and Development Agency (BPDA) to ensure that the transportation elements of the Project are designed to allow the city to meet urban planning goals, neighborhood desires and landowner development objectives. This includes constructing the Project in phases, and in a manner that accommodates future development to the maximum extent possible.

2.3.2 Rail Operations Goals and Objectives

The Goals and Objectives of the rail yard are to optimize the efficiency of MBTA commuter rail service by locating a layover facility to the west of South Station. This will help to reduce operating capacity constraints that currently affect on-time performance into South Station by reducing the number and length of non-revenue trips, relieving congestion and minimizing track conflicts. The rail yard will also support MBTA’s need to accommodate future service increases and fleet expansions. Locating a fully developed layover yard in close proximity to South Station will allow commuter rail fleet vehicles to be easily serviced between runs and will reduce GHG emissions through shorter non-revenue runs and the ability to plug-in during layover.

2.3.3 West Station Goals and Objectives

The Goal and Objective of West Station is to provide a neighborhood-oriented, multi-modal transportation hub that supports and integrates the existing and future transportation demands and development in the Allston/Lower Allston neighborhoods. This element plays an important role in helping support future Smart Growth development opportunities.

2.3.4 Pedestrian and Bicycle Goals and Objectives

The Goals and Objectives of providing dedicated pedestrian and bicycle infrastructure promote the healthy transportation options of walking and bicycling. An extensive network of sidewalks and bicycle tracks will be incorporated into the design of Cambridge Street, the new urban street grid, and connections to West Station from the north. Pedestrian and bicycle connections to West Station from the Commonwealth Avenue/Beacon Street area (south of the railroad) will also be provided.

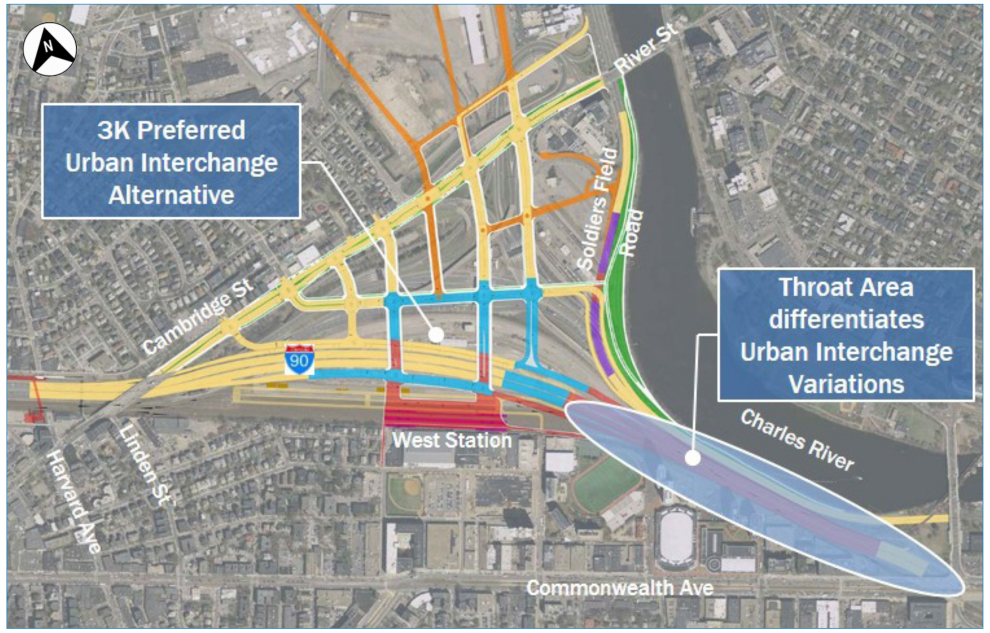
The proposed network of pedestrian and bicycle elements will reconnect sections of Allston now cut-off from each other by the existing rail yard. It will also provide new direct connections to expanded parkland and open space where none exist today.

3 Alternatives Analysis

The Preferred Alternative Urban Interchange 3K was developed sequentially, beginning with the results of the Alternatives Analysis described in Attachment 9 of the Environmental Notification Form (ENF). The ENF described the then-preferred Urban Interchange 3J Series concept, which included three components: the reconstruction and realignment of the I-90 interchange, the reconstruction of a rail layover facility at Beacon Park Yard (BPY), and the construction of a new commuter rail station, designated as West Station. The features of the ENF 3J Series Preferred Alternative are illustrated in Figure 3-1 (provided at the end of the chapter).

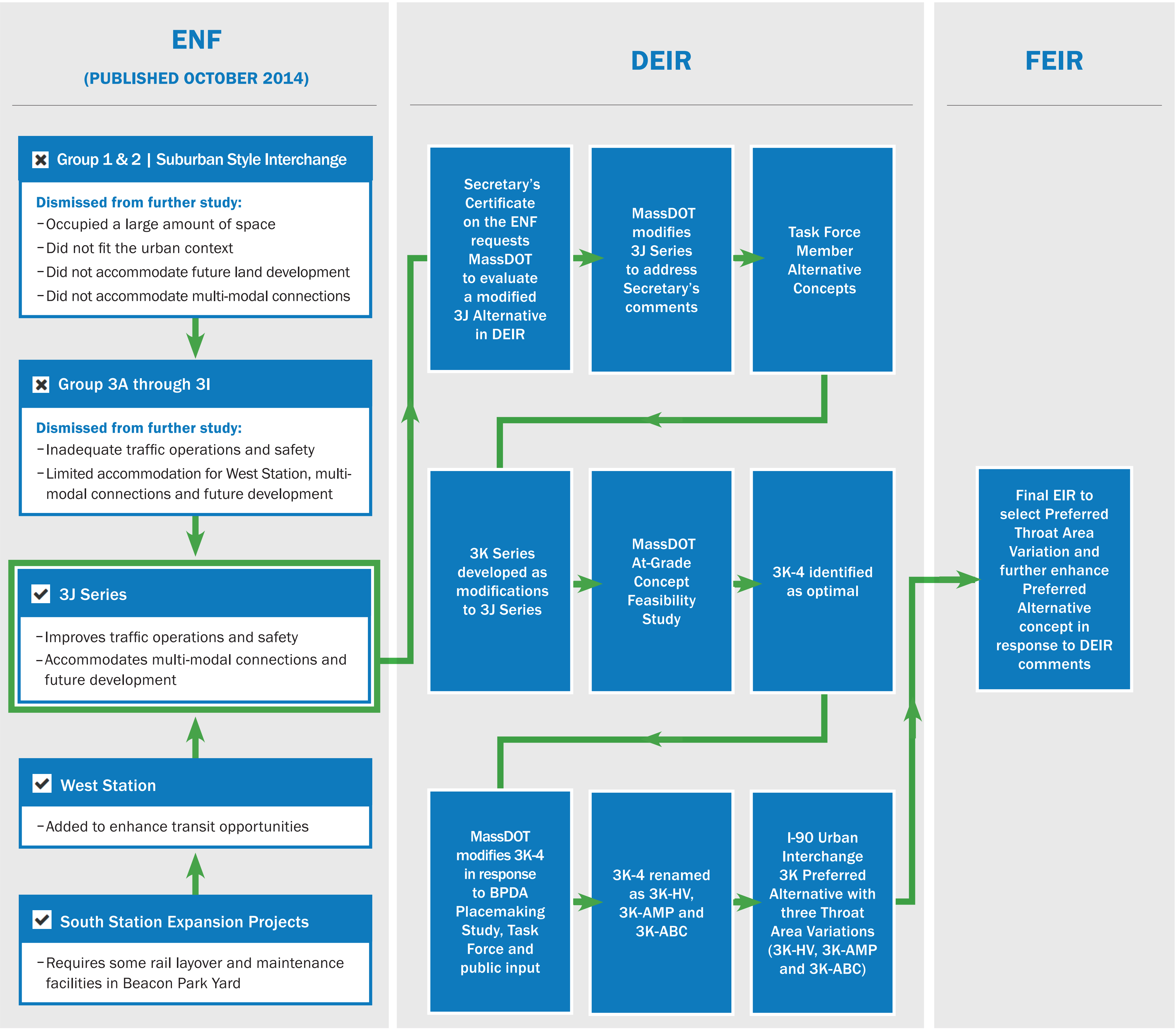
After the publication of the ENF, the Massachusetts Department of Transportation (MassDOT) continued refining and enhancing the Project concept. The Secretary's Certificate on the ENF provided guidance and suggestions to improve the 3J Series concept. Project stakeholder input from the Task Force, ongoing public participation, inter-agency collaboration, and coordination with Harvard University and abutters provided additional approaches and ideas.

Taking all of this input into consideration, MassDOT developed the current 3K Preferred Alternative with three variations for the Throat Area. These variations are illustrated in Figures 3-2, 3-3 and 3-4. The adjacent flowchart, entitled "Summary of Preferred Alternative Concept Development," graphically represents the steps taken to determine the 3K Preferred Alternative.



I-90 Urban Interchange 3K Preferred Alternative

Summary of Preferred Alternative Concept Development



ENF

(PUBLISHED OCTOBER 2014)

☒ **Group 1 & 2 | Suburban Style Interchange**

Dismissed from further study:
- Occupied a large amount of space
- Did not fit the urban context
- Did not accommodate future land development
- Did not accommodate multi-modal connections

☒ **Group 3A through 3I**

Dismissed from further study:
- Inadequate traffic operations and safety
- Limited accommodation for West Station, multi-modal connections and future development

☑ **3J Series**

- Improves traffic operations and safety
- Accommodates multi-modal connections and future development

☑ **West Station**

- Added to enhance transit opportunities

☑ **South Station Expansion Projects**

- Requires some rail layover and maintenance facilities in Beacon Park Yard

DEIR

Secretary's Certificate on the ENF requests MassDOT to evaluate a modified 3J Alternative in DEIR

MassDOT modifies 3J Series to address Secretary's comments

Task Force Member Alternative Concepts

3K Series developed as modifications to 3J Series

MassDOT At-Grade Concept Feasibility Study

3K-4 identified as optimal

MassDOT modifies 3K-4 in response to BPDA Placemaking Study, Task Force and public input

3K-4 renamed as 3K-HV, 3K-AMP and 3K-ABC

I-90 Urban Interchange 3K Preferred Alternative with three Throat Area Variations (3K-HV, 3K-AMP and 3K-ABC)

FEIR

Final EIR to select Preferred Throat Area Variation and further enhance Preferred Alternative concept in response to DEIR comments

This chapter describes the development and evaluation of alternatives considered for each Project component: the highway interchange, the rail layover facilities and West Station. As the elements are interconnected, each alternative has an influence on the design of the other transportation infrastructure within the Project Area. MassDOT evaluated the alternatives according to their ability to meet the Project Purpose and Need, as well as guiding criteria developed in collaboration with Project stakeholders.

This chapter also provides documentation of the guiding criteria used to develop and evaluate the I-90 Urban Interchange 3K Preferred Alternative and the Throat Area Variations. The Task Force, which met through February 2017, provided continual input on the refinement of the Preferred Alternative and the variations presented herein (see the Public Participation Summary in Chapter 9). Additionally, the City of Boston Planning and Development Agency (BPDA), in collaboration with MassDOT, performed a placemaking study of the interchange concept. The placemaking study documents can be viewed on the City of Boston website, http://www.bostonplans.org/planning/planning-initiatives/i-90-allston-interchange.

The placemaking standards and master planning considerations in that study contributed to the further refinement of the interchange concept. The alternatives development also considered future uses proposed by the landowner, including urban development and potential for air rights construction over the railroad facilities.

This chapter is organized to provide a review of the conceptual development of the highway interchange Preferred Alternative and streets (3.1), the rail layover facilities and West Station (3.2), and finally, the three Throat Area Variations (3.3).

The No Build Alternative is included as a benchmark against which the impacts of other alternatives are compared (see the Assessment of Impacts in Chapter 5). The No Build Alternative retains all existing interchange infrastructure with the exception of the existing I-90 viaduct, which due to its current severely deteriorated condition, will require significant rehabilitation in its current location and configuration.

A description of existing conditions, including I-90, Soldiers Field Road (SFR), rail yard, Worcester Main Line and Grand Junction Railroad (GJR), is provided in Chapter 4.

3.1 Development of Highway/Streets Alternatives

In the October 2014 ENF, MassDOT identified Concept 3J as the preferred interchange option, herein referred to as “I-90 Urban Interchange Preferred Alternative.” Selection of this concept was the result of an approximate six-month evaluation/screening process conducted by MassDOT in conjunction with the Task Force. A total of 16 concepts were examined, and Concept 3J represented the end result of an iterative/evolutionary process that tested a variety of interchange components and alignments until the best combination was identified. After the issuance of the Massachusetts Environmental Policy Act (MEPA) Certificate on the ENF, modifications and enhancements to the 3J Alternative were developed and analyzed, yielding an updated and improved version of the 3K Preferred Alternative. During the development of 3K, three variations of the urban interchange arose as potential solutions for the Throat Area (see Section 3.3 for a discussion of the Throat Area Variations).

3.1.1 Guiding Criteria for the Development of the Preferred Alternative and Throat Area Variations

This section summarizes the guiding criteria used to develop the I-90 Urban Interchange 3K Preferred Alternative and the three Throat Area Variations. The development of the basic Preferred Alternative is documented in the October 2014 ENF, which examined a series of alternatives including several suburban-type interchanges and a separate series of urban-type interchanges. Additionally, a set of less traditional solutions was considered including:

- Depressing I-90 below existing grade levels
- Elevating all of the rail tracks above I-90
- Reducing interstate highway standards
- Completely relocating SFR
- Considering alternative interchange configurations, including a diverging diamond interchange

The guiding criteria used to develop the Preferred Alternative began with developing alternatives that met the overall Project Purpose and Need. Through interaction with the Task Force, a set of priorities was developed that captured the defining elements shared by MassDOT and the public and agency stakeholders represented on the Task Force. The priorities include:

- Improving safety for all modes (walking, cycling, driving, transit)
- Realigning I-90
- Including a context-sensitive design to:
    - lessen the impact of the interchange
    - avoid inducing cut-through traffic with a new configuration
    - reconnect sections of Allston to each other and to the Charles River
- Protecting the neighborhood during construction
- Providing and improving accessible connections to PDW Path
- Creating a more vibrant Cambridge Street that serves all modes
- Supporting future expansion of transit services
- Providing accessibility to transit at future West Station

As detailed in the ENF, a set of criteria was employed to screen alternatives and select a preferred interchange concept. The criteria focused on the alternative’s ability to:

- Meet the Project Purpose and Need
- Provide multi-modal connectivity
- Promote safety
- Create pedestrian routes
- Create bicycle routes
- Provide access to West Station
- Promote safe traffic operation
- Consider travel time/level of service
- Provide intersection connectivity
- Create streetscapes
- Manage stormwater runoff
- Improve stormwater quality
- Minimize historic impacts
- Minimize wetlands impacts
- Minimize noise impacts
- Maximize/create parks and open space
- Manage contaminated soils
- Improve air quality
- Accommodate future land use development and community cohesion
- Control construction-phase impacts including cost, schedule and lifecycle cost/maintenance

Application of the guiding and screening criteria resulted in the preferred I-90 Urban Interchange Alternative 3J, which was documented fully in the ENF. The Secretary’s Certificate on the ENF, along with public and agency comment letters, continued interaction with the Task Force, and the results of the BPDA Placemaking Study, led to a series of modifications and enhancements, resulting in the current I-90 Urban Interchange Preferred Alternative 3K with three Throat Area Variations. A more detailed description of the development of the Preferred Alternative follows. An evaluation of the 3K Preferred Alternative and the advantages and disadvantages associated with each of the three Throat Area Variations is provided in Chapter 5.

3.1.2 No Build Alternative

As outlined in the ENF, the deteriorated I-90 viaduct is at the end of its serviceability. The structural condition of the viaduct is such that this important piece of infrastructure would be extensively rehabilitated if the Preferred Alternative is not implemented. Rehabilitation would include upgrading the viaduct’s original limited design load capacity to current structural capacity requirements.

Under the No Build Alternative, rehabilitation of the viaduct superstructure will result in similar lane and shoulder widths as the existing condition. A slight increase in the travel way width will be achieved with new bridge railing and median barrier, and elimination of the existing safety walks. The scope of the No Build Alternative will include this work only because the need exists in any case. The work will be limited to match existing infrastructure at the east and west ends of the viaduct within MassDOT’s current right-of-way (ROW). The required extent of viaduct rehabilitation is described below.

Under the No Build Alternative, it is assumed that the MBTA would establish a layover facility within its current easement area at Beacon Park.

Description of Highway Viaduct Rehabilitation under the No Build Alternative

The scope of work for viaduct rehabilitation under the No Build Alternative will essentially be a superstructure replacement with rehabilitation of the substructure. This work will include: replacement of the bridge deck; replacement of the steel stringers; repair and strengthening of the steel cross girder pier caps; and repair/retrofit of the concrete columns and foundations.

Replace Bridge Deck: The existing deck has exceeded its useful life. It has significant deterioration and numerous patches throughout the viaduct. Full replacement is proposed. Replacement of the bridge deck will include replacing the bridge railings and median barrier, which do not conform to current crash standards. In addition, the placement of an asphalt overlay will be considered to the extent possible to improve the driving surface and provide additional protection for the new bridge deck. The existing viaduct has an exposed concrete deck with no overlay. The additional weight of an overlay may require strengthening of other viaduct components, such as the columns and cross girders.

Replace Steel Stringers: The steel stringers, particularly the exterior stringers, have deterioration and section loss. Based on the MassDOT Bridge Manual, the vast majority do not meet the load rating requirement for a major rehabilitation. The paint system on the stringers is also failing and requires repainting. Considering the costs associated with strengthening, repairing and repainting stringers, full replacement of all superstructure steel stringers is recommended for this alternative.

Strengthen/Repair Cross Girders: Similar to the steel stringers, the steel cross girders that serve as pier caps have deterioration and section loss at various locations. Almost all of the cross girders will require strengthening of the bottom flange with the addition of cover plate(s). Approximately half of the cross girders also require strengthening of the top flange. Isolated repairs of the web and stiffeners are required. Lastly, all of the stringer connections will be replaced and the cross girders repainted. Repairing these cross girders is preferred, due to the constructibility challenges and potential traffic impacts that would result from trying to replace these members. Much of the repair and strengthening work could occur from below without impacting highway traffic. This work may interfere with the Worcester Main Line operations below the viaduct.

Strengthen/Repair Concrete Columns and Foundations: The existing columns have scattered deterioration throughout and will be repaired, as required. In addition, these elements were not designed to current standards, including seismic requirements. As such, it is anticipated that all of the existing columns will receive a Fiber-Reinforced Polymer (FRP) wrap to increase their lateral capacity. Some columns may also require strengthening at the base, at the interface with the pile cap. It is anticipated that the existing piles can support the increased weight of an overlay and the larger live load design vehicle. Consideration may be given to adding new columns in the center of the span of several piers that are comprised of only two columns. Lastly, replacement of the bearings under the cross girders will be considered to reduce loads onto the foundations. This work may also interfere with the Worcester Main Line operations below the viaduct.

3.1.3 Development of I-90 Urban Interchange Concept

In order to establish a reasonable scope of work, the ENF identified components of the Preferred Alternative that were common to the alternatives analysis. The common components are as follows:

- I-90 interchange with added focus on Cambridge Street
- I-90 viaduct
- Rail operations (layover yard) and West Station
- Pedestrian bridge replacement over I-90
- SFR re-alignment

The following two components were identified as having the most significant variability, and they represent the focus of the ENF in an effort to identify a Preferred Alternative:

- I-90 interchange
- Cambridge Street

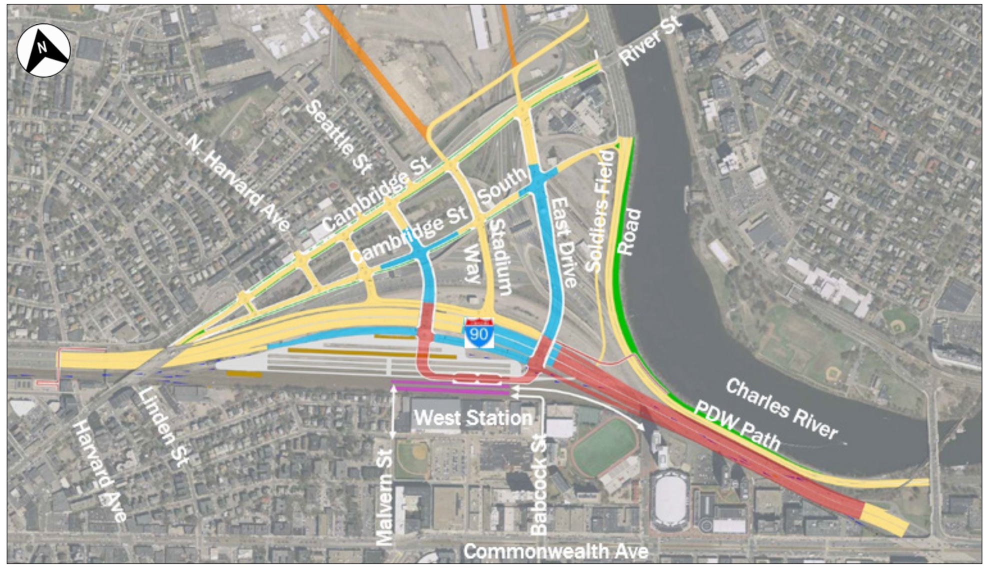
Through a public participatory process evaluation, Alternative 3J was identified in the ENF as the best combination of proposed features subject to further analysis and refinement in the DEIR. In addition, the Preferred Alternative components listed previously, which have sufficient commonality for the filing of the ENF, were re-analyzed and refined to establish a comprehensive Preferred Alternative.

3J Series Modifications

The ENF identified three options of the 3J concept for further consideration:

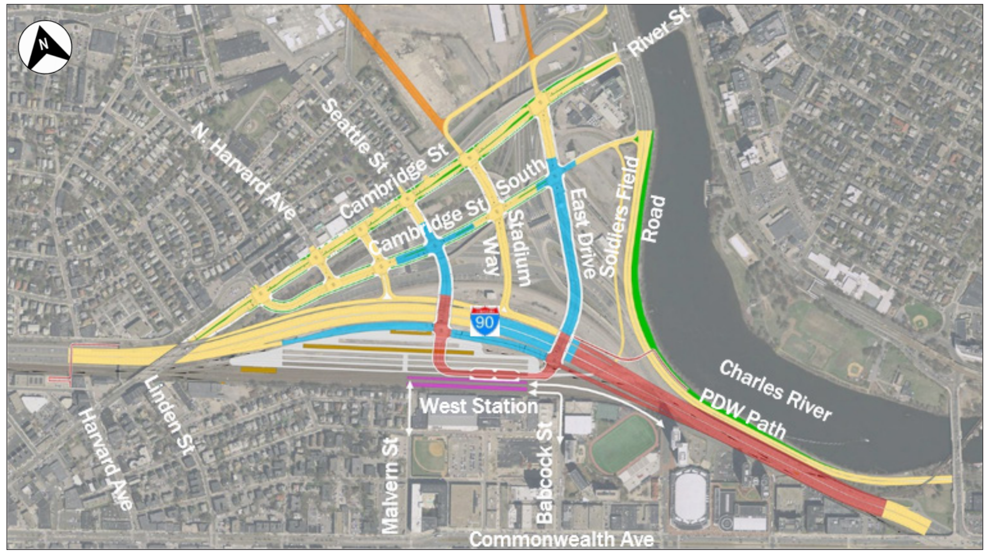
Concept 3J-1

Concept 3J-1: Eastbound and westbound ramp connections are made via four connector roads to a two-way Cambridge Street. The four connector roads have two-way operation.



Concept 3J-2

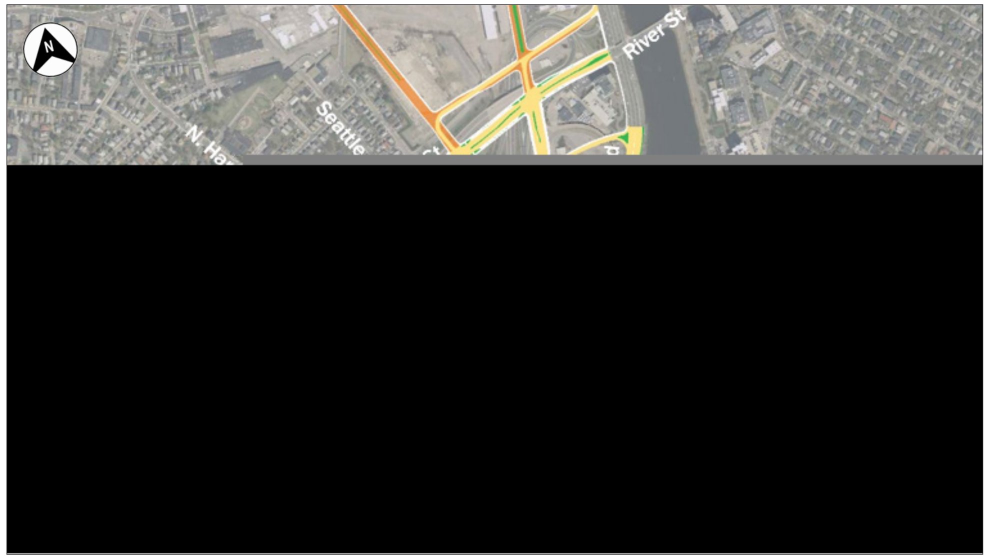
Concept 3J-2: Eastbound and westbound ramp connections are made via four connector roads to Cambridge Street. A new parallel roadway to the south of Cambridge Street, known as Cambridge Street South, is proposed. Cambridge Street has one-way operation in the westbound direction and Cambridge Street South operates one-way in the eastbound direction. The four connector roads operate two-way.



Concept 3J-3

Concept 3J-3: Eastbound and westbound ramp connections are made via four connector roads to Cambridge Street. A new parallel roadway to the south, known as Cambridge Street South, is proposed in the same location as Concept 3J-2. Cambridge Street and Cambridge Street South have two-way operations, as do the four connector roads.

In the MEPA Certificate on the ENF, the Secretary of the Executive Office of Energy and Environmental Affairs (EOEEA) required MassDOT to evaluate a new concept in the DEIR that modifies Concept 3J ramp connections. This modification changes the 3J eastbound and westbound I-90 ramp connections to the local roadway network so that the eastbound ramp connections occur at the Seattle Street and Stadium Way Connectors, and the westbound ramp connections occur at East Drive and the West Connector (i.e., the eastbound and westbound connections at Stadium Way and East Drive are "flipped"). This concept is identified as Concept 3K. Concepts 3J-1, 3J-2 and 3J-3 were then adjusted to represent the 3K Concept that flips the ramps, and the concepts were renamed 3K-1, 3K-2 and 3K-3. 3K-3 was renamed to 3K-4 because one of the modifications under 3K is to move Cambridge Street South further to the south. The shift to the south is significant enough to differentiate it from the 3J-3 location.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Concept 3K-4

One of the consequences of the proposed 3K ramp modifications is that the distance, or balance, between the ramp connectors in 3J cannot be met. In 3J, the four eastbound and westbound connections to the local network are staggered (i.e., alternated), providing approximately equal spacing between the connectors on the eastbound and westbound ramp systems. With Concept 3K, the eastbound ramps connect to the two “inside” connectors while the westbound ramps connect to the two “outside” connectors. Therefore, the two bridge structures that carry the eastbound on/off ramps over the I-90 mainline, at Seattle Street and Stadium Way, are only approximately 500 feet apart, as opposed to the approximate 700-foot spacing provided in Concept 3J. The traffic operational implications of this change are presented in Section 5.8.

Other changes under Concept 3K are as follows:

- A second vehicular connection to SFR is added by retaining the 3J street network connection that is south of the existing Hilton’s Double Tree Suites, and by adding another direct connection from Cambridge Street South to SFR eastbound.
- Sight distance is reduced on the I-90 westbound exit ramp to the signalized intersection at East Drive, and the intersection queue length is extended further east onto the ramp. Both consequences are satisfactorily mitigated by moving the westbound exit ramp end further to the east.
- Distances between connector intersections are reduced, resulting in reduced queue length available at signalized intersections, but this condition is satisfactorily mitigated with a coordinated signalized network having adequate lane assignments.
- The most easterly connector profile and elevation passing over I-90 is lower than the 3J concept by 10 feet. This is due to the overpass bridge being located further to the west where the I-90 profile is also lower.
- The westbound ramp collector between the intersections at East Drive and the West Connector is longer, resulting in improved and safer vehicular weaving operation.

Concept 3K-4 was identified as superior to Concepts 3K-1 and 3K-2 because it has the best operational characteristics and traffic circulation flexibility. It offers two-way circulation throughout the street network and provides a more flexible and extensive street system. Cambridge Street South under 3K-4 represents the best pedestrian and bicycle connectivity in comparison to the other two concepts. It provides a more direct link between the North Allston neighborhood and the Dr. Paul Dudley White Bike Path (PDW Path). The new street location is also the most responsive to urban planning, land development and parcel access, as identified by the BPDA. These particular characteristics, exemplified by Concept 3K-4, were favored the most by Project stakeholders. See Figure 3.1-1 illustrating the differences between the 3J-3 and 3K-4 concepts.

3K-4 Modifications

Initially, the notion of changing the eastbound ramp connection from East Drive to Stadium Way, as proposed in the 3K Concept, was raised during the Task Force process by the BPDA representatives in 2014. It was also an idea that surfaced during an urban design charrette sponsored by the Boston Society of Architects in 2014 for the Beacon Park Yard (BPY) redevelopment site. In addition, Harvard University Beacon Yards, LLC, the owner of BPY, had expressed a strong interest in incorporating this change into the preferred concept.

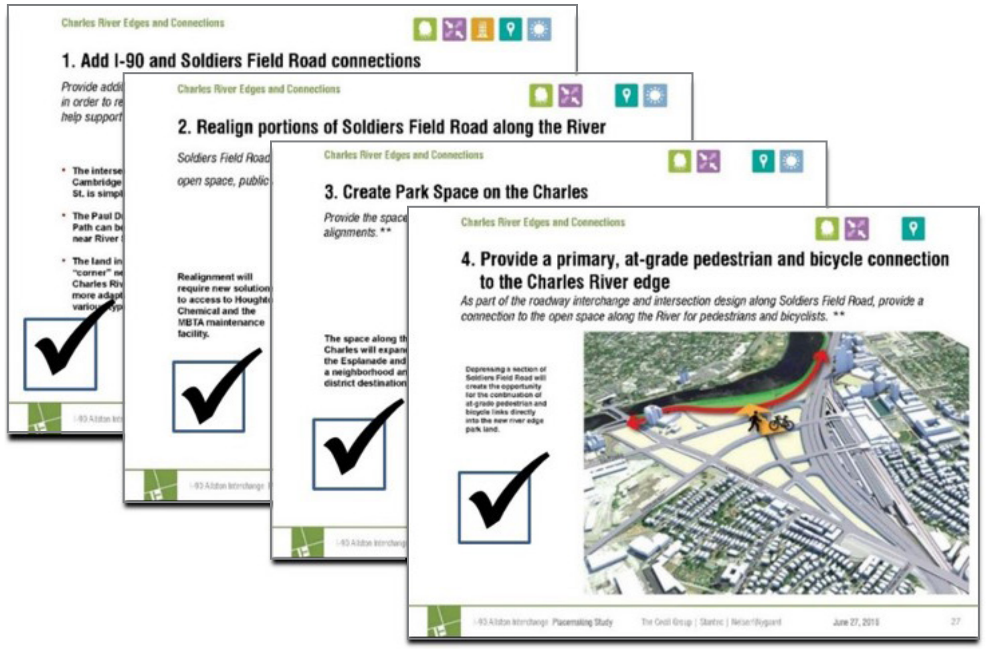
The rationale for modifying the ramp connections is that the majority of East Drive will be at grade if connected to the westbound ramps. Because East Drive is the closest north-south connector to the Charles River and SFR, it will serve the portion of the BPY that will have the highest redevelopment values, as this area is essentially riverfront property. From an urban design perspective, having East Drive at an elevation fairly close in elevation to SFR, as opposed to a rising embankment elevation on the approach to the bridge over I-90, makes this adjoining parcel more attractive and less costly for redevelopment.

Modifications to 3K-4 were explored in response to Task Force requests and public input. The following components of 3K-4 and the guidelines provided below are common to all modifications:

- Pedestrian/bicycle connections north-south, between the proposed street grid to Malvern Street and Babcock Street;
- Pedestrian/bicycle connections between points north of the I-90 interchange and the Charles River on an enhanced “Complete Streets” corridor with a two-way separated bike lane;
- Pedestrian/bicycle connections between points south of the I-90 interchange and the Charles River;
- Expanded open space and parkland adjacent to the Charles River, including a widened PDW Path;
- Placemaking design approach accounting for full-build potential, with attention to the street grid layout, city block geometry and street orientation;
- Franklin Street pedestrian bridge replacement, designed to be visually attractive, located to provide as direct a connection as possible (replicating the original Franklin Street connection), with visible, safe access points, and situated to minimize ROW, business and utility impacts; and
- Intersection treatments designed to minimize conflicts to the most practicable extent between motorists, pedestrians and bicycles, improve safety for all users, encourage yielding behavior, and minimize exposure to motor vehicles, thereby attracting more people to bicycle.

Modifications to 3K-4 are presented and evaluated below and illustrated in Figure 3.1-2.

Placemaking. The Project infrastructure will promote more community cohesiveness, with spatially inviting travel corridors, byways and destinations, and strategic placement and detailing of Project components to encourage interconnections within the Project and surrounding neighborhoods and spaces. To that end, the following modifications were incorporated as a result of the placemaking process and supported by the Task Force.


Charles River Edges and Connections

1. Add I-90 and Soldiers Field Road connections

2. Realign portions of Soldiers Field Road along the River

3. Create Park Space on the Charles

4. Provide a primary, at-grade pedestrian and bicycle connection to the Charles River edge

*As part of the roadway interchange and intersection design along Soldiers Field Road, provide a connection to the open space along the River for pedestrians and bicyclists. ***

Depressing a section of Soldiers Field Road will create the opportunity for the continuation of at-grade pedestrian and bicycle links directly into the new river edge park land.

Realignment will require new solution to access to Houghton Chemical and the MBTA maintenance facility.
The space along the Charles will expand the Esplanade and a neighborhood and district destination
I-93 Allston Interchange Placemaking Study
June 27, 2018
27

MassDOT incorporated “Charles River Edges and Connections” Placemaking Standards into the Preferred Alternative

1. **SFR Connection.** It was deemed desirable to reduce the scale of Cambridge Street. To help achieve that goal, 3K-4 was modified to include an I-90-to-SFR vehicular connection to increase access between the street grid and SFR. This consequently reduces the volume of circulating traffic on Cambridge Street, through street grid intersections and other streets within the network. The connection between SFR and I-90 becomes more direct, and consequently, reduces exposure between vehicles and pedestrians/bicyclists.
2. **SFR/River Street Exit Ramp Eliminated.** With the new connection described above, the intersection of SFR at Cambridge Street was simplified, essentially eliminating the need to retain the SFR westbound exit ramp to River Street. As a result of the elimination of the ramp, the area formerly occupied by the ramp was converted to an enhanced PDW Path section with open space and landscaping. Also as a consequence of the ramp elimination, westbound traffic destined for Cambridge would exit SFR, travel East Drive to Cambridge Street and turn right to proceed into Cambridge. This modification may be viewed as inconvenient to those who currently travel the route, but traffic volume and impacts will be relatively minor, as described in Section 5.8.
3. **SFR Shifted Westward.** SFR was realigned on a long sweeping curve to the west, away from the Charles River, as the roadway emerges from the narrow Throat Area adjacent to the I-90 viaduct. This realignment created over two acres of new publicly accessible open space contiguous to the river’s edge.
4. **Depress SFR Below Grade.** The SFR realignment to the west was combined with a proposed below-grade depressed section of SFR that enables construction of an at-grade overpass structure to carry vehicles, pedestrians and bicyclists. The at-grade overpass enables pedestrians and bicycles to easily connect between the street grid spaces and the newly created public open space along the Charles River. The formerly proposed Concept 3J pedestrian/bicycle bridge structure over SFR that required grades up to 5% was eliminated. The depression of SFR in this area allows for the continuation of the bicycle and

pedestrian path along the north side of Cambridge Street South to connect to the newly created parkland at a level grade.

5. **Landscaping on SFR Overpass.** The proposed SFR overpass structure was widened to support landscaping on the deck. This separates pedestrians and bicyclists from vehicular traffic and provides a continuous, connected common theme of scale, separation, landscaping and amenities between the street grid district and the open space on the Charles River.
6. **Landscaping Aprons on I-90 Bridges.** Widening the two north-south connector road bridges over I-90 to provide landscaping aprons was requested through the placemaking study, but is not included as part of the Project. However, widening the bridges is not precluded from future consideration, in coordination with future development by Harvard University.
7. **East-West Transportation Link to Cambridge Street Bridge.** A new east-west vehicular and pedestrian/bicycle connector between West Station and the Cambridge Street Bridge, located parallel to the southerly Project limit at the Pratt Street and Wadsworth Street neighborhood and elevated on structure over the railroad tracks and yard, was promoted for inclusion in the Project by some advocates. The immediate need for the elevated connector is not well supported, but future air rights development over the railroad tracks may identify this connection as desirable at that time. The Project will not preclude future construction of this structure.
8. **North-South Transportation Link to Commonwealth Avenue.** Investigation of a potential north-south transportation link between the reconfigured I-90 interchange and Commonwealth Avenue was requested of MassDOT. The intent of this new connection is to generally improve north-south connectivity and to also better understand the potential traffic reductions that might be realized on the portions of Harvard Avenue and Linden Street north of Brighton Avenue if this new roadway connection is provided as part of the Project. Because of grade (elevation) constraints and connectivity limitations associated with West Station and the I-90 interchange, the most practicable location for this connection was determined to be via Malvern Street. For analytical purposes of this DEIR, two distinct options of this alternative are described and evaluated in Section 5.8: (1) a connection that will be open to all traffic, and (2) a connection that will be restricted to transit vehicles (buses) only with various routing options.

   At this time MassDOT is not proposing to take any actions relative to constructing this connection as part of this Project. The infrastructure proposed will not preclude this future connection should others wish to pursue this as a separate project. A pedestrian and bicycle link along this alignment has been part of the Project since the ENF and remains part of the option discussed within this document.

9. **North Harvard Street/Cambridge Street South Intersection.** The westerly terminus of Cambridge Street South was shifted from the Lincoln Street intersection to the North Harvard Street intersection. An intersection at Lincoln Street will be preserved and serve as a direct connection linked to the I-90 westbound ramps. These changes reduce the number of vehicular turning movements for vehicles traveling between the North Allston neighborhood and I-90, and limits neighborhood impacts. The additional north-south streets proposed into the street grid emanating from Harvard's Allston North Landing also establish relief routes for traffic originating within the street grid and I-90 that may otherwise use North Harvard Street. Traffic analysis that includes these changes is provided in in Section 5.8.
10. **Cambridge Street South Shifted South.** Cambridge Street South was shifted further to the south, thereby creating more developable land area north of I-90 and expanding the depths of proposed property parcels to more attractive proportions. The improved geometric layout of the street grid enhances the potential for more flexible and desirable future development. The southerly shift aligns the desired pedestrian/bicycle route more directly between North Allston and the PDW Path, and also provides a better alignment for the vehicular connection to the new SFR ramps.

Additional modifications to Concept 3K-4 included the following elements:

Houghton Chemical Railroad Connection. Houghton Chemical and Harvard University negotiated an agreement regarding Houghton Chemical's railroad connection. The chemical company will abandon its rail spur line connection between their facilities on the property south of Cambridge Street and adjacent to the Hilton's Double Tree Suites and the Worcester Main Line track that runs under the I-90 viaduct. The abandonment of the spur line will eliminate proposed at-grade railroad crossings at Hotel Lane and Cambridge Street South. It will enable opportunities for roadway realignment, open space creation, and significantly improved pedestrian and bicycle connections.

I-90 Shifted South. As a consequence of shifting Cambridge Street South further to the south, I-90 also shifted south. By shifting I-90 further to the south, the gradients on all north-south connector roads will be less steep because the distances between the I-90 overpass bridges and Cambridge Street increase and the differences in elevation between the bridges and Cambridge Street will be achieved more gradually. The I-90 horizontal alignment and resulting sight lines will also improve as a result of the larger radius highway curve that becomes possible with the southerly shift. The capacity of the proposed layover yard decreases with the shift of I-90 to the south because less space will be available for track storage. A discussion of the layover yard is provided in Section 3.2.

Cattle Drive Added. Concept 3K-4 includes Cattle Drive, a new north-south connector linking the street grid to Harvard's North Allston Landing, terminating in the south at the easterly end of West Station. Stadium Way shifts to the west to make way for the new connector. The resulting north-south orientation of the proposed street grid becomes fairly evenly spaced, and therefore, more attractive for future land development. As a consequence of the adjusted street grid, the Windom Street intersection at Cambridge Street will be eliminated and the proposed Stadium Way alignment will pass closely to the east of the former intersection location. The Windom Street neighborhood becomes more isolated from a through-traffic perspective, with a connection proposed to Harvard's North Allston Landing street system. Stadium Way is proposed as a future street constructed by Harvard University.

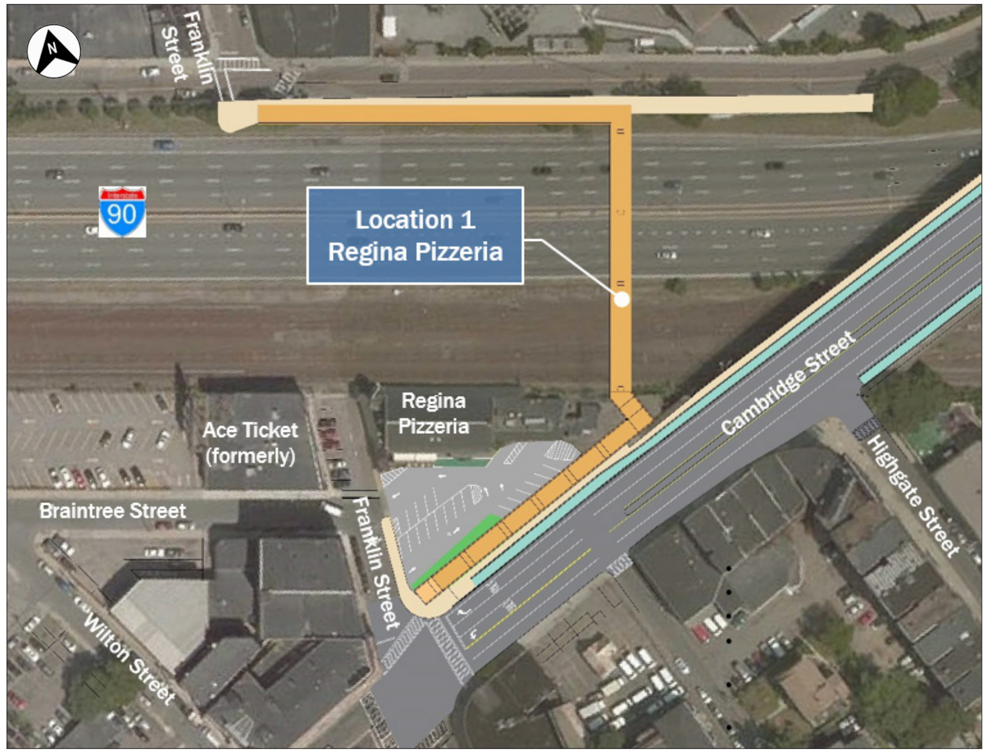
Developable Land and Future Air Rights. By shifting the southerly limiting boundary of the proposed street grid to the south, the amount of developable land at ground level increases and the extent of air rights development decreases. The Project will not preclude accommodation for future development over the shifted I-90 highway section, the layover yard and the commuter rail tracks.

Franklin Street Pedestrian Bridge Replacement. The deteriorated and substandard pedestrian bridge located approximately 250 feet west of the Cambridge Street Bridge over I-90 will be replaced with a new, widened pedestrian bridge that meets Americans with Disabilities Act and Architectural Access Board (ADA/AAB) accessibility standards. Several goals for the replacement were identified:

- Minimize the number of switch backs on the approach ramps for ease of bicycle movement;
- Orient the bridge toward Franklin Street as much as possible. This orientation is preferred because it reverts the desire line for pedestrians and bicyclists crossing I-90 back to the former Franklin Street location. This crossing was placed in a pedestrian tunnel due to increased rail operations in the late 19th century. This tunnel was closed and replaced with the current bridge when the I-90 extension was constructed; and
- Maximize safety improvements (provide lighting at termini, improve Lincoln Street crossing, and maximize visibility at the termini from nearby higher activity locations to increase safety).

Three alternative locations were studied for the replacement of Franklin Street Bridge. Each alternative touches down on Lincoln Street on the north side of I-90 at the intersection of Franklin Street, but the southern terminus location varies. One location is adjacent to the Regina Pizzeria parcel, which is approximately the location of the existing bridge. A second location touches down at the parking lot on the north side of Braintree Street. A third alternative location touches down at the intersection of Franklin and Braintree Streets and requires the demolition of the former Ace Ticket Building.

A bridge at any of the three locations will become an iconic neighborhood element for those crossing over it and those passing under it on I-90. The goals for the new bridge will be met with differing degrees of success depending on the location and variations described below:



Location 1 Alternative Pedestrian Bridge Replacement

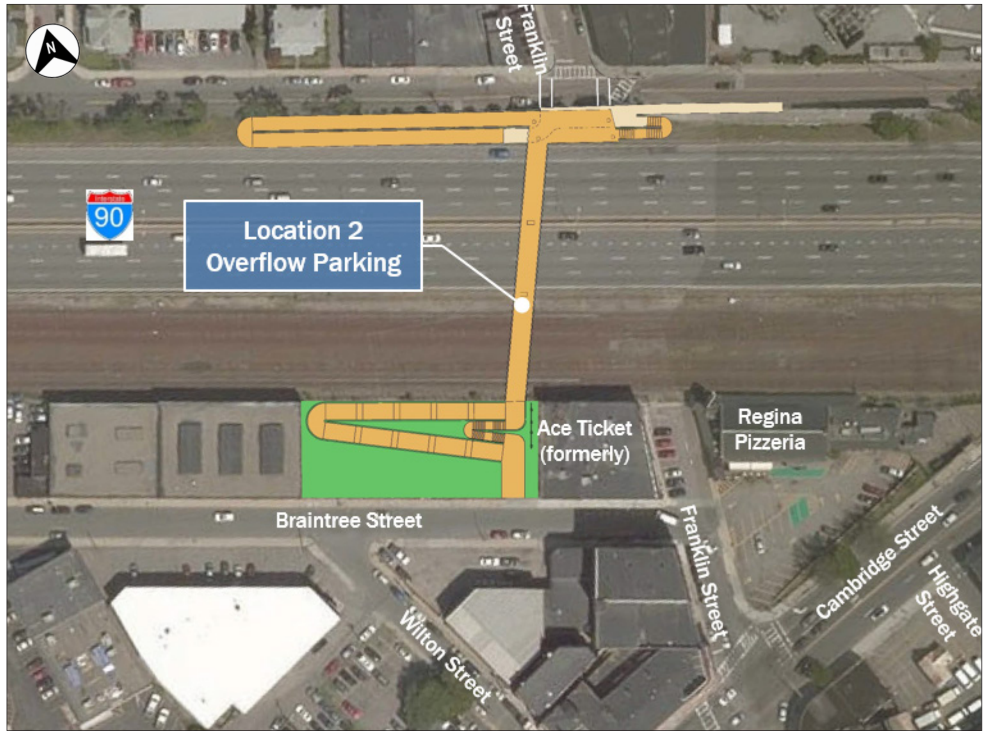
Location 1 - Replace bridge in approximate current location within parking lot of Regina Pizzeria property. This alternative places the new bridge east of the existing bridge on a perpendicular alignment over I-90 with the southerly ramp connection to the local street network at the Cambridge Street/Franklin Street intersection. The northerly ramp connection is adjacent to Lincoln Street with the ramp descending in the westerly direction, similar to the existing bridge connection. The southerly connecting ramp is parallel, but not connected to the westerly Cambridge Street sidewalk because the existing Cambridge Street gradient exceeds the ADA maximum 5% grade and the required level landings for that grade will not be provided. The new ramp, constructed at a 7.5% gradient, meets accessibility standards because the required level landings at 30-foot intervals will be included.This alternative has two options for the southerly ramp configuration. The first option will require a switch back ramp alignment whereas the second option will not, based on ramp length. The length of ramp, and the subsequent need for a switch back that lengthens the ramp, will be predicated on the elevation differential between the two ends of the ramp and the maximum allowable gradient with the level landings included. The bridge surface elevation, which sets the elevation at the higher end of the ramp, is established by the proposed 6-foot-deep pedestrian bridge structure. This will be required for the standard type of steel girder bridge typically constructed by MassDOT and also by the railroad and highway clearances required under the bridge. The second option does not require a switch back because the depth of structure will only be 3 feet. The elevation differential is, therefore, 3 feet less than the other variation, and a shorter ramp is possible. However, this thinner type of bridge will be non-traditional, expensive and will require non-standard maintenance.

Common to both options, the southerly terminus is very visible, adjacent to an active intersection with high pedestrian and bicycle activity. The switch back option impacts additional parking area at Regina Pizzeria in comparison to the thinner bridge structure option. This parcel is within the Harvard Avenue Historic District, which is listed in the National Register of Historic Places. The building that houses Regina Pizzeria, the former Boston & Albany Railroad Depot, has also been designated a Local Landmark by the Boston Landmarks Commission. It was designed by Shepley, Rutan and Coolidge, a successor firm to H. H. Richardson, and built in 1887. The site around the building was designed by Frederick Law Olmsted, however, none of the landscape features remain.

Under Section 106 of the Historic Preservation Act of 1966 and Section 4(f) of the Transportation Act of 1966 (see Chapters 4.6 and 5.6), FHWA is required to take into account the effects of its undertakings on historic properties. Adverse effects to historic properties are to be avoided or minimized whenever possible.

The Location 1 alternative was determined to be less than optimal due to an acquisition taking from a historic property, and the fact that it reduces parking spaces immediately adjacent to the restaurant. It was dismissed from further study.

Location 2 - Bridge to the west of the current location – overflow parking lot. This alternative includes several options in bridge orientation across I-90 and in configurations of the northerly and southerly ramps. Bridge location options that cross the Franklin Street layout result in impacts to the dense concentration of utilities that cross I-90 within the layout limits. Consequently, bridge location options that skirt the former Franklin Street layout are preferred to avoid those impacts. The northerly ramp must fit in the relatively narrow strip between I-90 and Lincoln Street. The primary objective will be to orient the ramp in the direction most favorable to the neighborhood desire line crossing I-90. That objective will be met with the ramp ascending from an enhanced crossing of Lincoln Street in the easterly direction to the bridge.



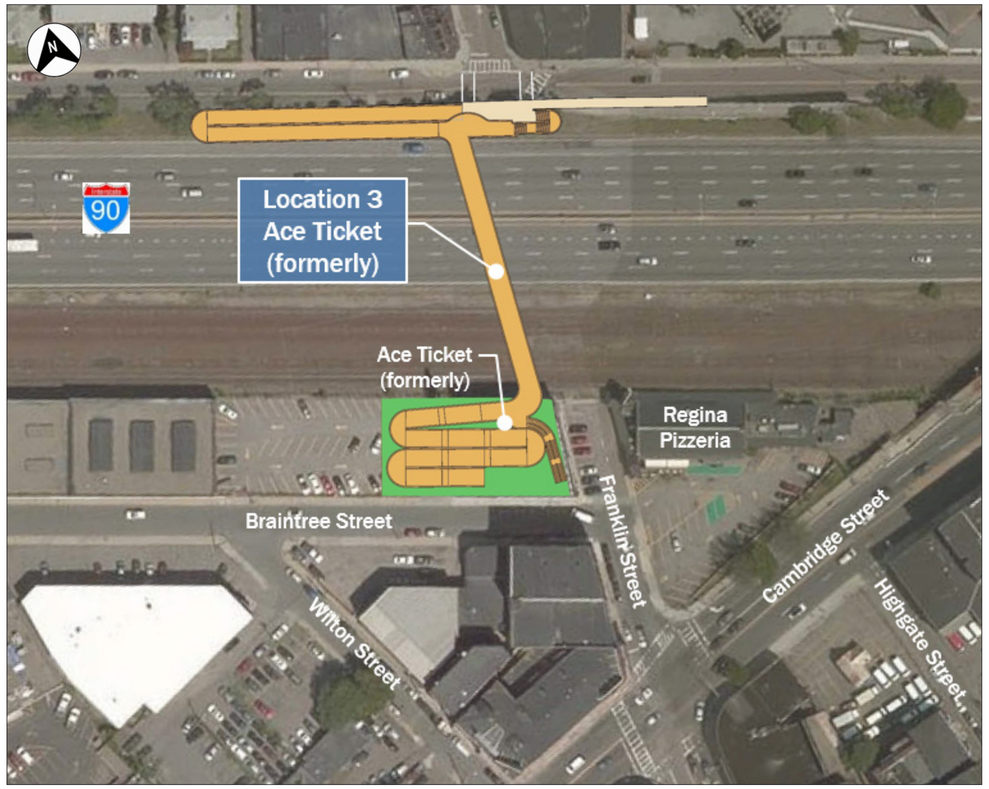
Location 2 Alternative Pedestrian Bridge Replacement

Bridge location options west of the former Franklin Street layout include southerly ramp configurations that either impact the existing parking lot parcel at 9-21 Braintree Street or that impact the parking lot parcel plus the adjacent two-story brick building at 20-30 Franklin Street (across from Regina Pizzeria). The parcel at 20-30 Franklin Street will be too small for the southerly ramp configuration, with its multiple turns, to fit entirely within it. A portion of the adjacent parking lot parcel will also be required for the ramp to fit, or the ramp can fit entirely within the parking lot parcel without affecting the building at 20-30 Franklin Street at all. If the building is removed with the ramp configuration extending into the adjacent parcel, the touchdown point of the ramp is visible from the Cambridge Street intersection at Franklin Street. This is a very desirable goal from a safety perspective. In addition, roughly half the parking within the parking parcel can remain. If the southerly ramp configuration is placed entirely within the parking parcel, all of the parking is lost and the ramp touchdown point is not visible from the Cambridge Street intersection.

The Location 2 alternative was determined to be less than optimal due to the acquisition of a portion of the lot, thereby splitting the developable lot into two smaller non-contiguous lots. In addition, it does not follow the Franklin Street desire line. Therefore, the 20-30 Franklin Street option was dismissed from further study.

Location 3 - Bridge to the west of the current location – former Ace Ticket location.

A pedestrian and bicycle bridge at this location will most closely conform to the Franklin Street desire line and provide the most direct visual and physical connection across the Turnpike. A bridge located directly along the center line of Franklin Street was considered but utilities running under the railroad tracks and I-90 along this corridor severely restrict the space available for foundations. A bridge with this alignment will be highly visible and will reinforce Franklin Street as a connection between North Allston and Allston Village. The bridge in this location will align with the neighborhood connectivity desire line. While the bridge and ramps will require the demolition of the former Ace Ticket building and the relocation of the billboard, the remainder of the Braintree Street property will remain as a single parcel, simplifying future redevelopment. The long ramp required will also impact the parking lot on the west side of the former Ace Ticket Building by removing approximately 25 of the 47 spaces.



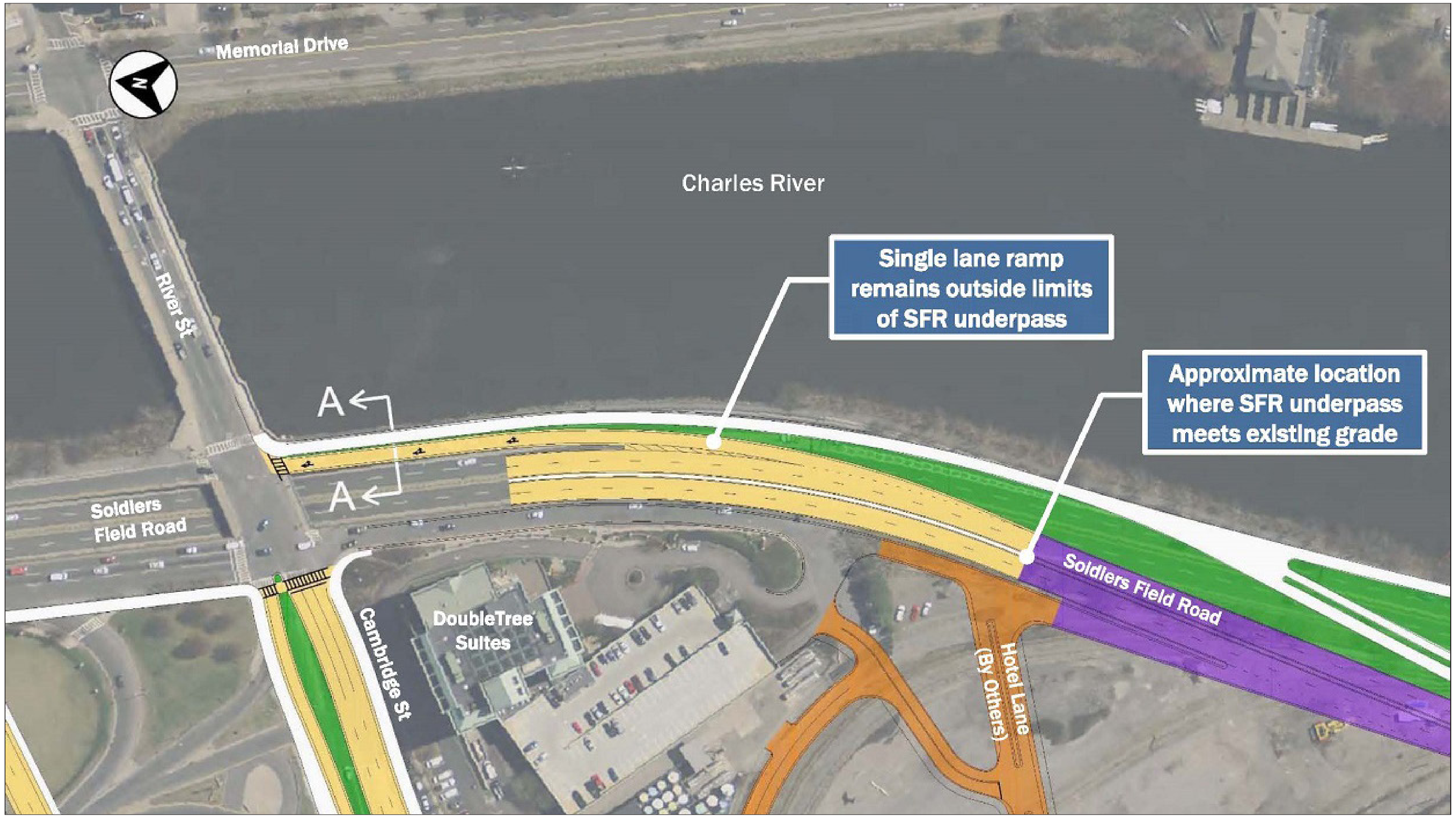
Location 3 Alternative Pedestrian Bridge Replacement

As with all the bridge options shown, the rounded corners at the ramp turns will be more welcoming to bicyclists traversing the bridge. In addition, generous space at the bottom of the ramps provides an area for pedestrians and bicyclists to pause before crossing the street. The staircase at the Braintree Street end of the bridge parallels the Franklin Street sidewalk where it touches down and is turned at the top to prevent bicyclists from accidentally overrunning the end of the bridge onto the stairs. There is space between the ramp and the sidewalk along Braintree Street for trees, benches and other amenities.

The stub of Franklin Street between Braintree Street and the railroad ROW is privately owned, and with the former Ace Ticket Building demolished, has the potential to be incorporated into a larger vision for redevelopment of the adjacent properties. A bridge in this alignment will attract some of the pedestrian and bicycle activity currently using Cambridge Street and likely increase pedestrian traffic on the western side of Harvard Avenue at the intersection with Cambridge Street.

Because pier locations are limited to the median of I-90 and the space between the southern edge of the Turnpike and the railroad tracks, in order to reduce the amount of ramp required, a minimal depth of structure for the bridge is preferred. This suggests a bridge type that will be supported from above, such as an arch, truss or cable-stayed structure. The northern end of all three bridge options described will land at a platform on the southern side of Lincoln Street at the Franklin Street axis. This landing will be the point where ramps and stairs will diverge, and it will become a strong visual element for those approaching from either direction.

Location 3 was determined to be the best pedestrian bridge location option because it most closely conforms to the Franklin Street desire line, provides the most direct visual and physical connection across I-90, and has the potential to be incorporated into a larger vision for redevelopment of the adjacent properties.



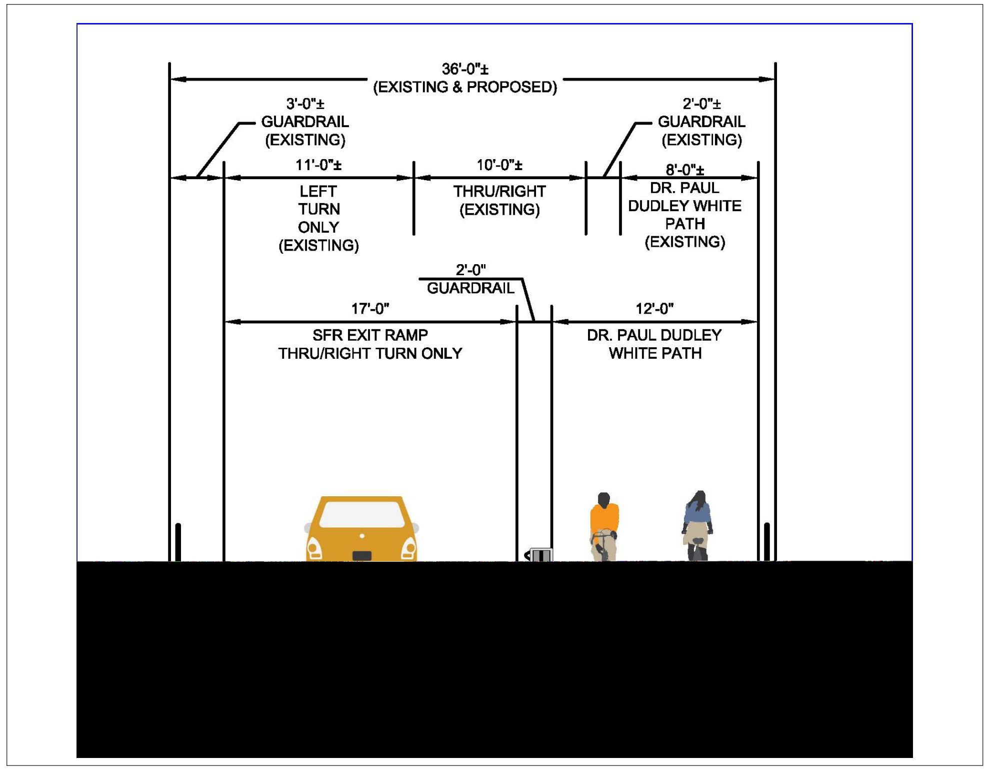
Graphic 3.1-1: I-90 Urban Interchange 3K with single lane SFR outbound ramp

Other modification considered for Concept 3K-4:

Retaining SFR WB off ramp at Cambridge Street/River Street. As currently proposed, the Project would eliminate the SFR westbound off-ramp to Cambridge Street/River Street in order to create enhanced pedestrian/bicycle facilities at this difficult section of the PDW Path between SFR and the Charles River (the Narrows). It would also improve traffic operations and create an enhanced open space area at this intersection. As discussed previously, drivers who currently use the SFR westbound off-ramp would instead use the new SFR off-ramp that would be relocated to intersect with Cambridge Street South. For drivers turning right from the ramp onto the River Street Bridge, this change would add approximately 800 feet (0.15 miles) of travel to their trip in order to reach the same point on the River Street Bridge. These drivers (90 in the AM peak and 150 in the PM peak) constitute a small proportion of the total traffic at the intersection, about 3% of the total entering volume during the AM peak period, and about 5% during the PM peak. The off-ramp users that make the right turn onto the River Street Bridge represent about 22-25% of the total ramp approach traffic during both the AM and PM peak periods.

An option to the full elimination of the westbound off-ramp was considered that narrowed the existing ramp from two-lanes at 21 feet in width to a single lane that would be 17 feet in width. A ramp width of 17 feet is the minimum required to accommodate provision for passing a stalled vehicle per AASHTO design requirements (see Graphics 3.1-1 and 3.1-2). The intent of this option was to provide a ramp that would maintain the right turn function for vehicles onto the River Street Bridge towards Cambridge. However, in order to limit the ramp to right turning vehicles only, a traffic island to restrict vehicles to turn right would be needed. Due to the limited space at the end of the ramp at Cambridge Street, a geometric island that physically prohibits the thru vehicle movement onto the SFR westbound Service Road cannot be constructed. Consequently, the thru movement would also be allowed and the left turns toward Cambridge Street westbound would be prohibited only by signals, signs and pavement markings. This option would enable the PDW Path width to increase from the existing width of 8 feet to 12 feet at the Narrows, but would not be wide enough to accommodate separate pedestrian/bicycle paths and open space afforded by the Preferred Alternative that eliminates the ramp.

From a pedestrian and bicycle safety perspective, the "partial" ramp option would be inferior to the Preferred Alternative treatment (i.e., the total elimination of the off-ramp). The Preferred Alternative eliminates all conflicts between the off-ramp vehicles and the high number of pedestrians/bicyclist trips (2,000 to 3,000 per day) who use the PDW Path. With the partial ramp option, there still would be a conflict between the pedestrians/bicyclists and vehicles turning right off of the ramp. A consequence of removing the dominant left turning traffic from the ramp is the potential to induce more right turning traffic onto the ramp because the ramp becomes less congested. Additionally, the pedestrian/bicycle crossing staging area at the end of the ramp would be dramatically reduced in size with the partial ramp option due to the presence of the ramp roadway.



Graphic 3.1-2: Section A-A Single lane SFR outbound ramp

The partial ramp option would also be slightly inferior to the Preferred Alternative from a traffic operations perspective. One of the significant benefits of the Project is the improvement in traffic operations at the critical intersection of Cambridge Street, River Street and SFR. With the Project, future (2040) intersection peak hour operations are expected to improve from LOS F to LOS B (AM) and LOS F to LOS C (PM). These are significant operational benefits for thousands of drivers per hour who will continue to pass through the intersection, most of whom are traveling into Cambridge (approximately 3,700 vehicles in the AM peak hour and 4,200 vehicles in the PM peak hour). The improvement to vehicular operations will also allow for more of the signal cycle time to be reallocated to the pedestrian and bicycle crossing phase.

The expected operational improvements that will result from the Project at the intersection are due to two main factors:

- Reduction in traffic volumes due to: (1) the elimination of the SFR westbound off-ramp; and (2) the redirection of SFR eastbound on-ramp traffic from this intersection to the proposed eastbound on-ramp relocated at Cambridge Street South.
- Simplification of the existing signal phasing at the intersection from a complex five-phase signal to a simpler three-phase signal, (including the user activated pedestrian/bicycle crossing phase), in the future.

With the partial ramp option, a slightly longer traffic signal phase would be required to process the SFR westbound off-ramp vehicular traffic (thru/right turns) with the concurrent pedestrian/bike crossing. The need for the longer signal phase would have a minor impact on expected traffic operations. Anticipated impacts associated with the partial ramp option could increase in the future if the amount of right turning traffic increases and more signal time is needed to process the ramp phase.

3.2 Development of Rail and West Station

This section presents the key features, evaluation criteria and design assumptions used in developing the railroad facility and alternatives.

Worcester Main Line

The Preferred Alternative and Throat Area Variations preserve two-track operation on the Worcester Main Line tracks. Improvements will be required to allow trains operating on the southerly mainline track (Track 2) to cross the northerly mainline track (Track 1) so that both tracks have access to rail yard layover tracks from the east and the west. Each Throat Area Variation will require different alterations to the Main Line tracks in this area, as discussed in Section 3.3.

Houghton Chemical Rail Spur

Within BPY, a 0.5-mile long rail spur provides service to Houghton Chemical from the GJR track. This rail spur is used for delivery of chemicals mixed at the plant. This rail service will be discontinued by spring 2019. The removal of the Houghton Chemical spur track opens more space and provides greater flexibility for the configuration of Project elements than was possible before the ENF was published. The discontinuation of rail service on the rail spur will improve the economic value of the future development parcels created by the Project.

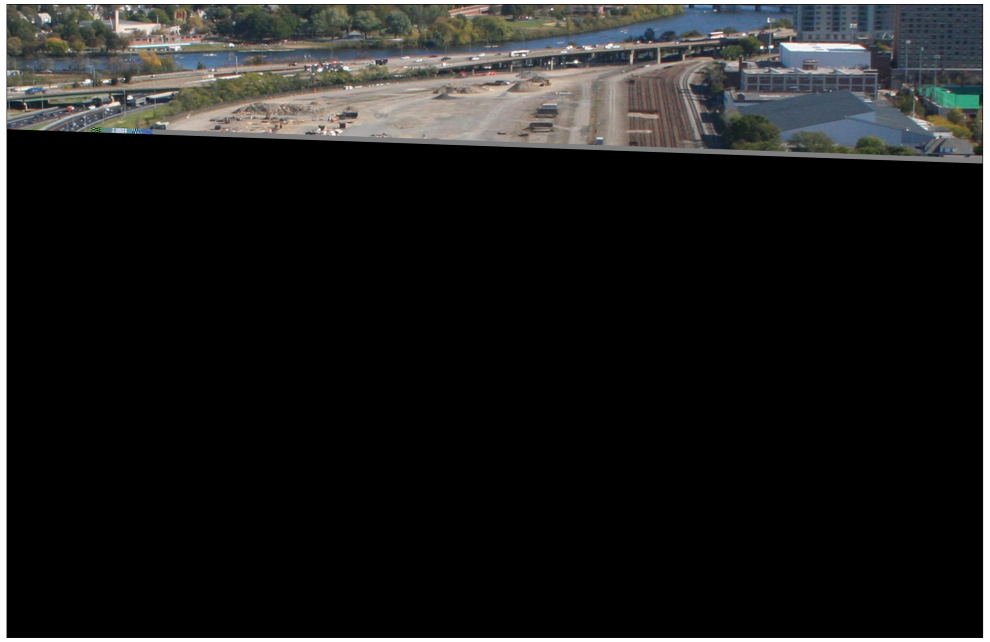
Grand Junction Railroad

GJR provides a vital rail link across the Charles River from the Worcester Main Line, and is critical to preserving existing MBTA repair and maintenance operations and freight service operating to the Chelsea Markets. The GJR connection provides the only metropolitan area access between South Side and North Side commuter rail activities. MBTA's South Side equipment that requires heavy maintenance uses GJR to cross the Charles River and access the MBTA's Commuter Rail Maintenance Facility (CRMF), the only such heavy maintenance facility on the entire commuter rail system. Removal of this connection would require a detour route of over 100 rail miles, traveling west to Worcester, north to Ayer, and then south/southeast into CRMF. The GJR connection is also an important Amtrak link allowing Downeaster trains to access its maintenance shop at Southampton.

The Preferred Alternative and all Throat Area Variations will preserve the GJR connection for MBTA and Amtrak use while not precluding future urban rail service connection between West Station and Kendall Square/North Station. The future commencement of such service has been identified by the Allston community as a priority.

Rail Yard

The rail yard located within BPY is along the MBTA Framingham/Worcester Line, approximately 3.8 track-miles from South Station. BPY is an industrial-zoned site that has historically been used as a train yard, most recently as a CSX Transportation (CSX) freight yard and intermodal terminal.



Aerial view of BPY

3.2.1 Rail Operations and Layover Requirements and Design Criteria

MassDOT conducted a comprehensive assessment of the use of the rail yard at BPY for layover as a component of the South Station Expansion (SSX) project. The SSX project evaluated 27 additional sites[1] to address the existing and future layover needs on the south side of the MBTA's commuter rail system. BPY was selected by MassDOT as the preferred location for layover to the west. Two other sites, Widett Circle and Readville Yard 2, were also included in the evaluation of future layover locations as part of the SSX project. The evaluation determined that all three sites will be needed to address the short- and long-term layover needs in the system.

MassDOT initiated the I-90 Allston Interchange Project during the development of the SSX project. Because the entire BPY site will be subject to MEPA review as part of the Project, MassDOT separated the BPY layover site environmental assessment from the SSX project and included it in the Project. This was done to provide a more focused discussion of short- and long-term impacts in the affected community. It also acknowledged that the Project, including the BPY layover facility, is expected to be constructed prior to the expansion of South Station. The design of BPY will be closely linked to the highway realignment and will be developed in close coordination with the design of the interchange Project elements. Therefore, although the need for the use of BPY as layover was identified as part of the overall SSX evaluation, the configuration and environmental impacts of the selected layover alternative are addressed in this DEIR.

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[1] South Station Expansion Project, *Environmental Notification Form, Attachment C - Layover Facility Alternatives Analysis Report,* March 2013. Available at: https://www.massdot.state.rna.us/southstationexpansion/Documents.aspx

Current MBTA South Side commuter rail service levels require daytime layover space for 28 train sets[2], but space exists for only 22 train sets, an existing shortfall of six layover spaces. Due to layover and track capacity limitations, the MBTA is forced to store some idling trains at the South Station terminal or run empty trains over idle track segments. Use of the South Station platform tracks for train layovers increases congestion at the terminal and creates operational conflicts. This situation is worse in inclement weather when trains operate behind schedule, equipment needs to be changed or other events, such as equipment failures or passenger emergencies. Upon completion of an extensive alternatives analysis as part of the SSX project, MassDOT identified BPY in Allston as part of its Preferred Alternative to meet the MBTA's current need for additional layover capacity to support commuter rail operations west of South Station[3].

Regionally, substantial future growth in passenger rail service is anticipated[4]. Based on the MBTA's needs for longer train sets, increased services and fleet acquisitions[5], as well as Amtrak's need to expand within its existing facilities, the MBTA expects that by 2040 it will need to store 49 train sets. If the current storage capacity is not increased within the South Side system, there will be a shortfall of space for 33 train sets.[6] With anticipated increased service demands for both Amtrak and the MBTA commuter rail at South Station, the lack of sufficient layover capacity for the MBTA will become a major operational constraint and will substantially limit rail service growth in the region.

Having the capacity to perform regular train maintenance functions is also essential for compliance with Federal Railroad Administration (FRA) regulations and MBTA policy requirements for daily cleaning, inspection, service and running repairs. MassDOT has concluded that expansion of South Station, along with additional layover and light maintenance capacity system-wide, are essential first steps toward improving operating reliability and on-time performance for service into South Station.

The movement and cycling of trains between the system layover and maintenance facilities is complex. The location of layover facilities is one of the main factors that determines the required movements for both revenue and non-revenue moves in and out of South Station. Existing South Side layover facilities are currently all located south of South Station and do not correspond to existing service operations. Approximately 60% of revenue trains approach South Station from the westerly

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3.2.2 West Station

The design of West Station is highly dependent on other aspects of the Project. For instance, the potential station elevations and pedestrian and bicycle connection elevations depend on the specified elevation of the highway, railroad tracks and interchange connections. MassDOT established minimum program requirements to ensure that the station design will be viable with the interchange alternative highway elevation and also flexible enough to operate adequately for any Throat Area Variation. West Station will consist of a series of components:

- rail passenger platforms and station
- bus and vehicular connections
- bicycle and pedestrian access ways

MassDOT developed alternatives for each of the major interdependent components of West Station: the position of the station and passenger platforms within the Project Area, the configuration of the bus loop and vehicle access, and the potential access points for pedestrians and bicycles. The Rail Yard and West Station Alternatives Analysis, which is included in Appendix A, describes these alternatives and evaluates them using a set of evaluation criteria to determine the best available configuration of West Station and access to the station. MassDOT determined that viable alternatives for the West Station commuter rail station will meet the following minimum program requirements:

- Provide a minimum of four revenue service tracks with platform access, one pair of tracks each serving the Worcester Main Line and one pair serving GJR;
- Provide a minimum of 18.5 feet of clearance above top of rail for trains;
- Limit overall station design elevation to not preclude future development above the yard;
- Include an at-grade access-controlled driveway to reach the passenger platforms for maintenance and emergencies;
- Provide a grade-separated bus layover platform with a minimum of five bus loading berths and five bus layover berths; and
- Provide unrestricted pedestrian and bicycle connections between the neighborhood to the south across the layover yard and I-90 to Cambridge Street and the PDW Path.

West Station will be centered on the MBTA's Framingham/Worcester Line, between the Boston Landing Station to the west and Yawkey Station to the east. Initially considered under MassDOT's proposed station location centralizes West Station between the adjacent Boston Landing and Yawkey stations, which will allow train sets to accelerate efficiently between them. Additionally, using both Malvern Street and Babcock Street to bookend the platforms provides for free customer access between the station platforms and the surrounding street network.

After considering various alternatives for the track and platform layout, MassDOT determined that three passenger platforms with four revenue service tracks will provide the best arrangement to maximize service to the location along the Worcester Main Line. This number of passenger platforms and revenue tracks will best accommodate future expansion and provide the greatest flexibility for potential future two track service along GJR into Cambridge. A three-platform station will allow for customers to walk directly to a side platform along the southerly property line, avoiding the need for some customers to cross over mainline tracks to reach a train platform. Additionally, this provides flexibility for train operations and maintenance; trains and passengers can be re-routed or re-designated to any track or platform in the event of required maintenance activity, breakdowns, severe weather or other unexpected conditions.

Bus and Vehicular Concourse

The bus concourse (or "bus loop") will be a critical component of West Station. It will provide direct public transit access to the station and facilities, and serve as the foundation for bicycle and pedestrian connections to the north and east. MassDOT considered multiple variations of the bus loop. Each variation provided a street connection from the station to the future street network across I-90 to the north. MassDOT developed bus loop alternatives that consider functional elements, such as benefits of one-way versus two-way traffic, separation of MBTA bus loading operations from other uses, types of vehicles permitted, convenient walking paths between bus loading and train loading access points, pedestrian and bicycle access, internal and external traffic circulation, pedestrian crossings, and number of loading and layover berths. Other alternatives considered the bus loop's connections to the future I-90 interchange and connections to the future street grid to the north. After considering various bus loop alternatives, MassDOT determined that a two-way bus loop alternative that meets the functional requirements described above will maximize bus loop services while minimizing potential traffic conflicts and pedestrian crossings.

Pedestrian and Bicycle Access

In accordance with MassDOT policy, West Station will provide enhanced pedestrian and bicycle connectivity through the Project Area with new pedestrian and bicycle connections to the station and across I-90. These active transportation connections will strengthen the existing pedestrian and bicycle path network and offer opportunities for connections to the PDW Path along the Charles River.

North-south movement of bicycles and pedestrians is currently constrained by the existing rail yard and highway interchange. The Project presents an opportunity to improve the connectivity of the Project Area to the surrounding community and to provide new active transportation connections to neighborhoods that will be developed as part of the overall shift in alignment of the highway and consolidation of the rail yard. Pedestrian and bicycle connections will be important features to ensure that West Station benefits the community surrounding the site. Pedestrian and bicycle connections to the north will be built into the bus platform and are discussed further in Section 5.7. For pedestrian and bicycle connections to the south of the station, MassDOT developed multiple alternatives that present various options for constructing pedestrian and bicycle access ways.

In developing the alternatives, MassDOT considered pedestrian sidewalk and bicycle lane widths, existing sidewalk conditions on neighborhood streets to the south, existing bicycle lanes on Cambridge Street and other streets, potential property acquisitions, access way grade changes, visual connections to Commonwealth Avenue to the south, and the potential for pedestrians and cyclists to use the station for "thru-access" across the rail yard and I-90. In addition, other alternatives considered potential connectivity and adjacency to the PDW Path along the Charles River.

West Station will be a local, neighborhood-oriented station serving customers (riders) who reside within a reasonable walking distance from the station location. These residents will be expected to use the new station for travel to Back Bay (to work or shop), South Station (Financial District, South Boston Innovation District), Logan Airport (via Silver Line connection), or Yawkey (Fenway events). Estimated walking distance will be most likely within one quarter mile radius of the station area. The actual walking distance within that radius may be longer than one quarter mile depending upon the walking route. Each of the pedestrian and bicycle access alternatives was developed with consideration of the expected pedestrian walking distance and associated service area.

The Preferred Alternative and Throat Area Variations provide shared-use (pedestrians and cyclists) connections to the neighborhood street network to the south. To ensure pedestrian and cyclist safety and station efficiency, MassDOT did not develop any pedestrian or bicycle access routes that involve an at-grade crossing of the tracks; each of the alternatives will be configured to bridge the tracks and connect to an elevated level of the station. Consideration was given to shared use path slopes and ramp lengths, and to minimizing property impacts associated with these paths.

In the 2040 Full Build, MassDOT intends to provide two independent pedestrian access ramps across West Station and BPY. One point of access will provide a ramp between West Station and the intersection of Malvern Street with Ashford Street via easement through private property located at 76 Ashford Street. The second path will connect between West Station and a point located at the northerly terminus of Babcock Street at BPY. The segment of Babcock Street to the north of intersection with Ashford Street was discontinued as a public street and is owned by Boston University (BU). An agreement will be required from BU to permit access across land under its control. A description of the two new bridges is described as follows:

1. **A new bridge connecting the end of Babcock Street with West Station and points north.** The northern end of Babcock Street drops significantly to an elevation roughly level with the rail corridor. In order for pedestrians and bicyclists to get to West Station or destinations beyond, a ramp of significant length will be required. This bridge will provide an important connection for the BU West campus.
2. **A new bridge connecting Malvern Street with the Seattle Street Connector and West Station.** A connection between Commonwealth Avenue and Cambridge Street will help connect two neighborhoods previously cut off from one another. With access to West Station also being provided from this new link, it will serve as a major pedestrian and bicycle corridor.

Locations of proposed pedestrian/bridge connections to West Station

MassDOT also considered construction of a shared-use ramp between West Station and Harry Agganis Way to the east. While several Task Force members supported this concept, BU representatives expressed opposition, citing safety and campus operational impacts as key concerns. Harry Agganis Way and its continuation onto Buick Street are also discontinued public streets now under BU ownership.

3.2.3 No Build Alternative

There will be no significant changes to the existing rail yard, Worcester Main Line operations, or pedestrian and bicycle connectivity under the No Build Alternative. Under an existing MBTA easement agreement with Harvard University, MassDOT will use the existing track, as of by right, for layover of commuter trains within the MBTA easement, needing only minor modifications to the yard leads. Existing tracks within the easement will support the layover of up to eight train sets on four tracks per the easement agreement. Electric plug-ins for locomotives will be installed to limit engine idling in conformance with regulatory agreements.

No bicycle and pedestrian connection will be built over the yard. The No Build Alternative will not meet the Project Purpose and will not adequately satisfy the Project goals of providing improved pedestrian and bicycle connectivity. Additionally, the No Build does not include West Station and will not provide a multimodal West Station connection.

3.2.4 Preferred West Station Design

The preferred design of West Station, under the Preferred Alternative and Throat Area Variations, will consist of the following:

- A two-level station (bus concourse level and rail platform level);
- Three 830-foot-long platforms accommodating up to a 9-coach trainset;
- Two elevators per platform, providing a redundant barrier-free access to and from all passenger areas;
- Circulation stairs, meeting desired Level of Service (LOS) minimums for the station;
- Maintenance stairs for track level access;
- Emergency egress;
- Full accessibility compliance per MAAB 521 CMR and MBTA's "Guide to Access" guidelines;
- Appropriate way-finding and handicap accessible platform signage per MBTA's Graphical Standards Manual and ADAAG requirements;
- Windscreens, benches, trash receptacles and recycling containers;
- Station lighting with 90-minute minimum battery back-up in the event of power loss;
- A sprinkler and standpipe system (due to the platform level being such a large covered area, the station will be considered enclosed);
- A fire command center (providing control and display of all fire protection systems, including detection, alarm communications, and other emergency systems such

as the smoke exhaust system) will be located on the bus concourse level and be designed in accordance with NFPA 72; and
- Crew quarters with restroom, locker and break room facilities for train/engine crews and yard maintenance personnel.

Bus Concourse will include:

- A fully canopy over live bus berthing and loading areas;
- Dedicated berthing areas for up to five standard MBTA 40-foot buses, with a separated area for bus layovers (also five berths);
- Kiss & Ride drop-off/pick-up areas for passenger cars, taxis, and private shuttles;
- Fully enclosed station head houses, with rail platform access, signage, and system maps, which will be un-manned and able to be locked during off-hours;
- A shared-use path along southern edge, connecting primary pedestrian and bicycle travel ways across the concourse; and
- A minimum 12-foot pedestrian and bicycle (shared use) connection to Malvern Street; a minimum 12-foot shared-use switchback ramp between Babcock Street and the bus concourse at Babcock Street; and bicycle parking with secure access.

It is currently anticipated that, at a minimum, 50 bicycle parking spaces will be provided. Connections will also include allocated space for a bike share "Hubway" station near bicycle pathways and station entrances. Capacity and final location shall be determined by the City of Boston and the MBTA.

The configuration of West Station will have slight variations under each Throat Area Variation and is further described in Section 5.9.

3.2.5 Preferred Layover Design

During design development and in coordination with the land owner, MassDOT developed a phased Project implementation approach for West Station and the rail yard. Until such time as the future development parcels are built out, the Central Transportation Planning Staff (CTPS) forecast shows very weak demand for a commuter rail station at this location, particularly in light of the nearby Boston Landing Station, which can be readily accessed by Lower Allston residents. As a result, in the 2025 Opening Year, the I-90 interchange will be realigned and constructed, but West Station will not exist.

In the 2025 Opening Year, the rail yard will consist of four layover tracks storing up to eight train sets. The four existing yard tracks will be reconstructed for improved functionality, including construction of electric plug-ins and paved driveways between tracks. Sometime thereafter, but before 2040, MassDOT will construct four new permanent tracks to the north of the four rebuilt layover tracks. The existing yard ladders will be reconstructed to accommodate the realignment of I-90 while supporting full access to all yard tracks from both east and west.

In the 2040 Design Year, the four original storage tracks will be removed to allow for the construction of West Station. The rail yard will retain the four northerly layover tracks, allowing storage of up to eight train sets.

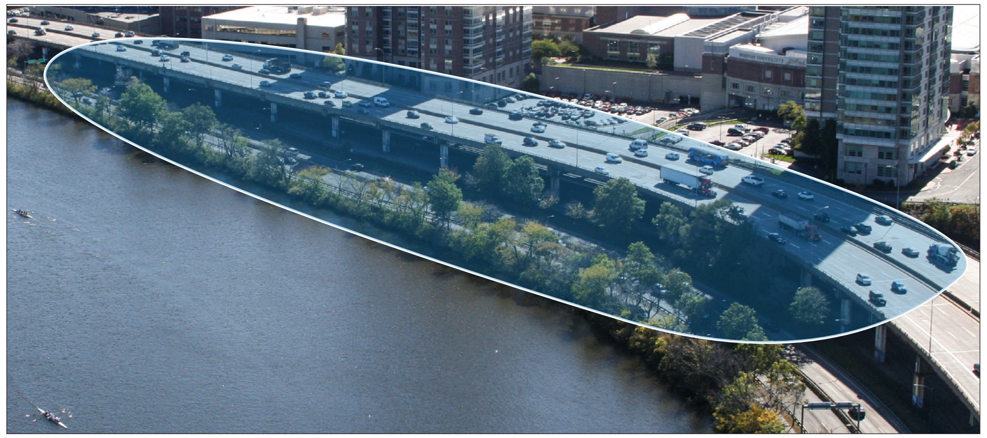
Having the eight-track layover yard before the 2040 Design Year is only possible with the 3K-HV and the 3K-ABC Variations. 3K-AMP precludes rebuilding the four existing yard tracks due to the proposed Worcester Main Line and GJR track configuration, which will require realignment of the main line outbound track to the north to make room for the railroad viaduct structure to descend to grade within the station area.

The four permanent storage tracks built to the north of the existing yard tracks will support a total of eight train sets for daytime layover.

The design of the layover facility and other rail components will include considerations to allow for future overbuild. Tracks within the yard will be aligned to leave room for a future three-foot column line between track pairs. The station and platforms will provide room for additional columns to allow the overbuild to extend over the station. On the east and west side of the yard, column placement will also be accommodated as the ladder tracks come together.

3.3 Throat Area Variations

Task Force representatives proposed two Throat Area Variations for consideration by MassDOT. The Throat Area is the relatively narrow existing multi-modal section where the I-90 viaduct is situated between the Charles River and BU, extending from where I-90 passes under the Commonwealth Avenue bridge to an approximate location about 2,500 feet to the west where the existing I-90 viaduct ends.



Aerial view of Throat Area between BU and the Charles River

These variations involve changes to the layout of transportation infrastructure, including I-90, GJR track, the two Worcester Main Line tracks, connecting tracks between the Worcester Main Line and GJR tracks, SFR and the PDW Path. Some changes will extend into the layover and West Station areas, but for the most part, these variations will be independent of other Project components, and as such, they are compared and evaluated accordingly.

The Throat Area concept presented in the ENF and further advanced in this DEIR, similar to the existing arrangement that has I-90 elevated and the rail operations at grade, is hereinafter referred to as Variation 3K-HV. It involves rebuilding the I-90 viaduct to improved, but not standard, shoulder widths at the same elevation as the existing structure, reconstructing SFR to its existing lane and shoulder width dimensions on an alignment shifted towards the viaduct to increase open space adjacent to the Charles River, and reconstructing the PDW Path to a widened, 12-foot section, 3.5' wider than it is currently. The existing GJR is maintained at grade (existing ground) close to its existing horizontal alignment, as the two existing Worcester Main Line tracks will be.

The first variation to 3K-HV, hereinafter called Variation 3K-AMP, originated from a Task Force member who authors an internet blog called "The Amateur Planner" and represents the advocacy group Livable Streets Alliance. The 3K-AMP Variation reconstructs the I-90 highway at grade (ground-level) or slightly below, adjacent to the Worcester Main Line tracks that are also at grade or slightly below, and relocates GJR to an elevated structure over the eastbound lanes of I-90 that will also include space for an elevated shared use path. The GJR structure descends within the layover yard easterly into the West Station platforms. The mainline track alignments shift southerly, thus requiring a 7-foot-wide property acquisition from BU, which will impact parking facilities (surface lot and structured), a building and utilities.

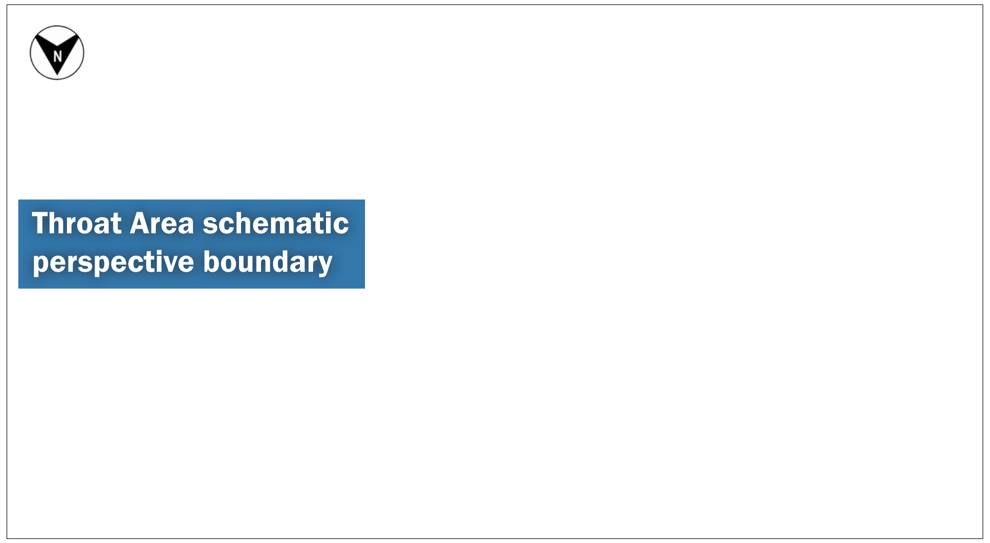
Relocating as much infrastructure as possible to at-grade elevations typically results in less initial construction cost and lower life cycle cost, in comparison to the existing elevated I-90 viaduct. In reality, this variation includes significant elevated structure that carries GJR track through the Throat Area, and the probable costs savings is more marginal than was likely originally envisioned. The elevated track infrastructure will also require sections of both I-90 and the rail ROW to be depressed in boat sections, and require retaining walls to be constructed along BU property.

The second variation, identified hereinafter as Variation 3K-ABC, was conceived by A Better City, an advocacy group that represents the interests of sponsoring Boston businesses and institutions. This variation was first publicly presented at a Task Force meeting in September 2015. It proposes to reconstruct I-90 mainly at grade and relocate all other transportation infrastructure at grade to the maximum extent possible, instead of the highway on viaduct. This approach to reduce elevated infrastructure helps lower both the initial construction cost and the long-term life cycle cost.

Because GJR must cross the Throat Area from the southeast to northwest to maintain its connection between Cambridge and the Worcester Main Line tracks east and west, a new railroad viaduct will be required to pass over I-90, then descend on retained fill structure on a parallel alignment between I-90 and the Worcester Main Line tracks. This alignment shifts the mainline tracks to the south, thus requiring a 7-foot-wide property acquisition from BU, which will impact parking facilities (surface lot and structured), building and utilities. A retaining wall and associated fill along the slope of the Charles River will also be required to construct the layout associated with the 3K-ABC Variation.

The two Task Force member variations were developed to only a conceptual level by their sponsors and were, therefore, not developed to the same degree of engineering as the 3K-HV Variation. At the request of the two sponsors and as supported by the Task Force, a consulting firm that was independent of any previous work, analysis or involvement of any kind on this Project was retained by MassDOT to advance the two variations to a similar degree of development as Variation 3K-HV. After the design development was completed, the firm conducted a comparative analysis of the three alternatives and presented their results at the February 11, 2016 Task Force meeting. The public involvement process is summarized in Chapter 9.

None of the Throat Area Variations described below will impact or limit the planned rail yard operations or West Station configuration alternatives to such a degree. The overall functionality and layout of a layover yard and West Station will have similar features across all Throat Area Variations. However, in some instances, the Throat Area Variations will have an effect on the configuration or operations of the rail yard or West Station. 3K-AMP will not provide the eight layover tracks included in each of the other variations. Rail operational impacts of each of the Throat Area Variations are discussed in Section 5.9, Rail Operations.



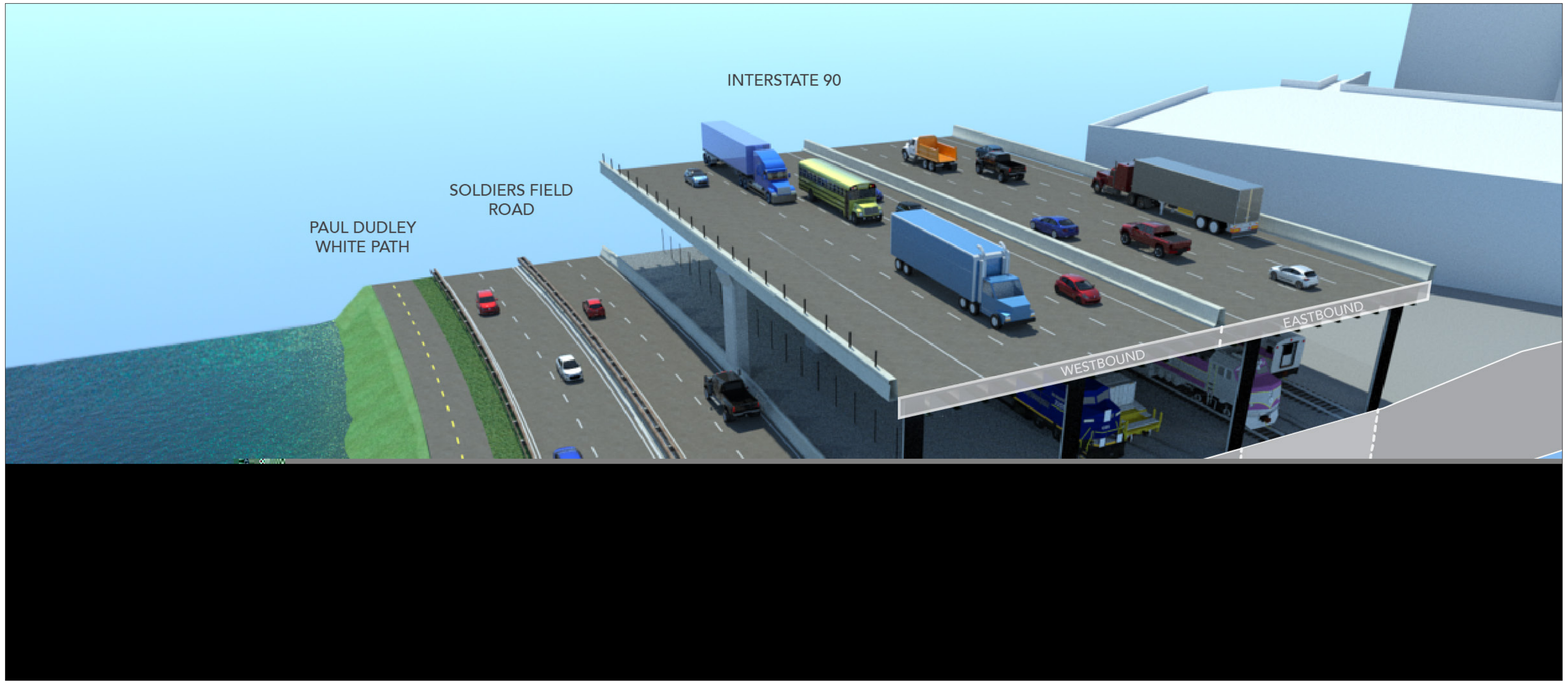
Location of Throat Area Variation schematic perspectives

3.3.1 3K-HV Variation

This variation resembles the existing highway and rail configuration within the Throat Area and replaces the 2,500-foot structurally deficient viaduct with a variably wider viaduct to include shoulders. It is anticipated that the foundations for the replacement structure will be comprised primarily of reinforced concrete elements, and the superstructure and pier caps will be comprised of steel elements similar to the existing viaduct. In addition, the replacement structure will be built to provide a longer service life and less maintenance than the existing structure. Replacing the viaduct allows for the shifting of SFR to the south, thereby creating space to the north allowing for an increase in the width of the PDW Path. This variation will not require shifting the viaduct onto BU property since there is sufficient space within the existing ROW of the Throat Area to fit all the roadway and rail elements. In addition, this variation avoids impacts to the Charles River.

The GJR alignment will be similar to the existing condition, with the track passing over SFR on the existing railroad bridge, descending in elevation to an alignment below the viaduct. Below the viaduct, the GJR will develop into two tracks and continue to the proposed West Station platforms and rail yard. The GJR Bridge over SFR will not require replacement with this variation because only minor changes to the GJR profile are required. Layout of the viaduct columns and piers will accommodate continuation of the second GJR track, facilitating the introduction of future urban rail into Cambridge. The GJR Bridge over SFR would have to be replaced at that time to support a second track. Since this bridge is not being replaced under this variation, the associated additional PDW Path connections (near the BU and GJR Bridges) included with the 3K-AMP and 3K-ABC Variations are not proposed. These connections, however, are not precluded from happening when the GJR Bridge is reconstructed in the future.

The two Worcester Main Line tracks run along a similar alignment as the GJR below the viaduct, tight to the southern state highway layout at similar elevations, providing crossover flexibility for tracks to access the proposed rail yard via a new yard lead from the GJR tracks. The proposed track layout below the viaduct offers maximum flexibility for trains to gain access to the West Station platforms and the rail yard from the east.



Schematic perspective of Variation 3K-HV looking east

Evolution of 3K-HV Variation

Within the 3K-HV Variation, MassDOT studied four sub-options to address the request in the ENF Certificate regarding alternative viaduct widths. These sub-options are primarily focused on the proposed viaduct cross section width, and the location and degree of difficulty for construction staging/traffic management. The proposed cross section widths for evaluation are the fully developed widths for the tangent section of the viaduct in the Throat Area. Reduced cross section width will be required for all variations at the east end of the viaduct in order to provide the necessary vertical clearances for the GJR track to the north and the Worcester Main Line tracks to the south. The cross section width of the viaduct increases towards the west end to accommodate the westbound off ramp and eastbound on ramp. The existing viaduct cross section will be approximately 108 feet outside of barrier to outside of barrier. The existing I-90 eastbound and westbound roadways are 48 feet curb-to-curb, generally providing four 11.5-foot-wide lanes with 1-foot-wide shoulders.

All four viaduct options provide four 12-foot-wide travel lanes in each direction of I-90. The variable widths that distinguish the differences among the variations involve the left and right shoulders. Shoulders provide important functions, including: safety, crash avoidance, drainage spread, snow storage, recovery area, improved sight distance, driver comfort and future maintenance. The benefit that these functions provide are even more pronounced on high-speed, high-volume roadways such as interstates. The four viaduct options that have been studied are described more fully below.

Option HV-1

This option meets current AASHTO design standards with standard lane and shoulder widths resulting in a cross section width of approximately 159 feet. This option aligns the viaduct as far to the south as possible without encroachment onto BU property (see Figure 3.3-1). On the north side, the viaduct widens as far as the existing median of SFR. This option requires a significant realignment of the GJR line including the replacement of the GJR Bridge over SFR. The proposed roadway must rapidly decrease in width on the approach to the Commonwealth Avenue Bridge, which is located several hundred feet east of the easterly end of the viaduct, in order to match the existing roadway section width and avoid impacting the bridge abutments.

This option limits the relocation of SFR because the new viaduct is so wide. The northern-most viaduct supports must be placed within the SFR median, thereby placing the SFR eastbound lanes under the viaduct. Minimal, if any, additional parkland in the Throat Area could be gained with this option.

The primary advantages of this option are:

- Compliant AASHTO section
- Improved safety
- More width available for I-90 viaduct staging (less construction stages and/or lane restrictions)

The primary disadvantages of this option are:

- Significant impact to Section 4(f) land
- Impact to GJR Bridge
- Impact to SFR traffic
- Potential impact to the Commonwealth Avenue Bridge
- Challenging constructability of columns within SFR
- Least compatible with I-90 realignment through the interchange
- Most restrictive on SFR relocation
- Higher construction cost

Option HV-2

Considering the many challenges associated with constructing a viaduct with a cross section that fully meets AASHTO standards in an urban environment, a reduced cross sectional width of 135’-9” was analyzed. Option HV-2 provides a cross sectional width that improves existing maintenance and safety conditions while recognizing the existing Throat Area constraints. This option provides a cross sectional width that has improved, although not fully standard, shoulder widths (See Figure 3.3-2). The cross sectional width of 135’-9” is the minimum possible width that can be constructed under traffic without the use of extensive temporary structure. The analyzed width allows the viaduct to be replaced in stages within the limits of its permanent width while maintaining three 11-foot-wide travel lanes in each direction. For clarification, this traffic management requirement pertains to all hours except late night/early morning periods when one or two lanes may be closed so that work operations that require additional encroachment can be conducted. In addition to the travel lane requirement for all temporary traffic lane configurations, 2-foot-wide temporary offsets are required between travel lanes and the adjacent construction zone. On this Project, the construction zone is established in almost all locations by temporary concrete barrier.

Under this option, the relocation of SFR will be feasible, but the extent of relocation will be limited by several constraints. The relocation will be limited within the Throat Area where SFR is parallel to the viaduct. Relocation will not be possible at all at the easterly Project limit approaching the BU Bridge or through the first horizontal curve at the westerly limit of the viaduct. These relocation constraints will be primarily due to the location of viaduct support columns needed, limitations on the allowable width of structural overhang for the viaduct deck, and the location of the potential second GJR track. These restrictions, coupled with the proximity to the Charles River, limit the extent SFR would be realigned to increase available open space. Within this portion of the combined viaduct/SFR alignment, the available width between BU and the river will be the most critical relative to the quantity of infrastructure that would be accommodated through this area. Therefore, SFR closely follows the existing alignment leading into the first curve proceeding from the east. Upon exiting the first curve and aligning to parallel the viaduct, SFR can shift to the south slightly under the viaduct, allowing the viaduct to overhang beyond the proposed outermost beam by approximately 12 feet, measured from the outside edge of the barrier. Within this segment, by shifting SFR to the south, approximately 6 to 12 feet of additional open space width is created. In addition, the width of PDW Path increases from 8.5 to 12 feet. Increased deflection of SFR away from the river will occur to the northwest of the proposed viaduct to accommodate the proposed SFR depressed section and ramps.

The primary advantages of this option are:

- Improved safety
- Improved width for maintenance (drainage, snow storage, etc.)
- Provides for additional open space along the Charles River
- Minimal impact to existing SFR traffic
- Compatible with preferred interchange and rail layouts

The primary disadvantages of this option are:

- Non-standard shoulder widths
- Impact to Massachusetts Water Resources Authority (MWRA) sewer line
- North fascia slightly closer to Charles River than existing conditions
- Impacts publicly inaccessible Section 4(f) land south of existing SFR adjacent to the viaduct

Option HV-3

Option HV-3 proposes 4-foot-wide shoulders, left and right, with 2-foot lateral offsets to barrier in both the eastbound and westbound directions, assuming that the shoulder width reduction on the viaduct will withstand the individual analysis required under the “long bridge” provision of AASHTO’s 2005 publication, *A Policy on Design Standards Interstate System*, the design criteria that must be met for interstate system projects under 23 CFR 625 as enabled under 23 U.S.C.109(b). A long bridge is defined as a structure greater than 200 feet in length. The resulting cross sectional width of the viaduct is 9 feet less in total width than HV-2. However, this option requires a substantial increase in the amount of temporary structure needed in order to construct it while maintaining traffic (see Figure 3.3-3). By reallocating the shoulder and offset widths, 8-foot-wide right shoulders will be created while preserving the required 4-foot-wide left shoulders, except that the 2-foot-wide lateral offsets will be eliminated. This reallocation of shoulder widths, without changing the total viaduct width, provides for a usable right shoulder.

The relocation of SFR will be very similar to HV-2. The shift of SFR will be feasible but remains limited by many of the same constraints as with HV-2. The provision for the second GJR track, and the I-90 westbound off-ramp near the west end of the Throat Area, limit additional shift of SFR from that shown in HV-2. Given these constraints, the SFR alignment with this option will be nearly identical to the SFR alignment provided with HV-2. The major difference with this option will be the extent of viaduct overhang above SFR, which would be less than with HV-2.

Similar to HV-2, by shifting SFR to the south, approximately 6 to 12 feet of additional open space width will be created in the Throat Area. In addition, the width of PDW Path increases from 8.5 to 12 feet. Increased deflection of SFR away from the Charles River could occur to the northwest of the proposed viaduct to accommodate the proposed SFR depressed section and ramp connections.

The primary advantages of this option are:

- Improves safety with usable shoulder
- Improves maintenance width (drainage, snow storage, etc.)
- Provides for additional open space along the Charles River
- Minimal impact to existing SFR traffic
- Compatible with preferred interchange and rail layouts

The primary disadvantages of this option are:

- Requires an extensive temporary structure to construct
- Impacts to MWRA sewer line
- North fascia slightly closer to Charles River than existing conditions
- Impacts publicly inaccessible Section 4(f) land south of existing SFR adjacent to the viaduct

Option HV-4

As required by the ENF Certificate, a highway viaduct reconstruction option was studied that is generally based on replicating the existing cross sectional width. The outside-of-barrier-to-outside of barrier width of the existing viaduct is approximately 108 feet. Concerns regarding additional viaduct width from comments received during the public process were typically associated with widening of the structure to the north towards the Charles River. The HV-4 cross section holds the existing northerly fascia line of the existing structure, but slightly widens the structure to the south by about 5 feet, resulting in a total proposed width of 113 feet. This slight widening will be required to increase the existing substandard travel lane widths to the required 12 feet. The widening results in the south fascia of the new viaduct lining up with the existing state highway layout line/BU property line. HV-4 would require the “use” of historic and public parkland properties and require evaluation under Section 4(f). The change in the use of publicly owned parkland, or in ownership from DCR to MassDOT, would also need to be reviewed under Article 97.

This option provides a final cross section that includes four 12-foot-wide travel lanes with 2.5-foot offsets to the bridge barrier (see Figure 3.3-4). The two feet immediately adjacent to any vertical barrier will generally not be considered part of the usable shoulder. Therefore, this option provides shoulder widths of 0.5 feet on each side. These shoulder widths will not meet either of the AASHTO standards referenced, and therefore, a design exception is required. The dimensions from the face of barrier to the face of barrier with this alternative will generally be the same as the existing viaduct (53 feet proposed vs. 52 feet existing), with the slightly increased roadway width obtained by the elimination of the existing safety walks on the viaduct. The lack of shoulder width will not improve safety, drainage or maintenance conditions unlike all of the other alternatives. In order to construct this option while maintaining traffic, a significant amount of temporary structure will be required. The temporary structure must be located in the space between the northerly side of the existing viaduct and SFR. This space will be utilized by the other options to construct permanent additional cross section width.

Maintaining the existing footprint of the viaduct provides an opportunity to increase the shift of SFR away from the river more than the other options. However, as with the other options, the extent of the shift will still be restricted by the provision to accommodate the future second GJR track and the exit ramp at the westerly end of the Throat Area.

The shift of SFR to the south will create approximately 20 feet, on average, of additional open space width in the Throat Area. In addition, the width of PDW Path increases from 8.5 to 12 feet in width. The deflection of SFR away from the Charles River will occur to the northwest of the proposed viaduct to accommodate the proposed SFR depressed section.

The primary advantages of this option are:

- Provides for the most additional open space along the Charles River
- Reduces construction cost
- Fewer impacts to utilities (MWRA sewer line)
- Minimal impacts to existing SFR traffic
- Compatible with preferred interchange and rail layouts

The primary disadvantages of this option are:

- Requires an extensive temporary structure to construct
- Substandard shoulder width requires Design Exception
- No refuge for motorists on viaduct
- Potential drainage spread/ponding hazards

Selection of Preferred HV Option

Safety will best be met by the HV-1 Option with full left and right shoulders, however, the proposed width of almost 160 feet will not be compatible with the existing interstate section to the east of the Throat Area or to the proposed interstate section to the west. A substantial length of the 2,500-foot viaduct will then need to be in sectional width transition between the two ends to match these conditions, which detracts from its intended benefit. The square footage of new structure will be the greatest of all the options, and consequently, will be the most expensive to maintain over its 75-year service life. The northerly extent of the HV-1 structure will impact SFR the most by requiring median-placed support columns without providing any mitigating relief in position or alignment.

In comparison to HV-1, the degree of safety offered by HV-2 will be almost as good. Full width left shoulders, as proposed in HV-1, will not be provided in HV-2. The HV-2 width of nearly 136 feet will be the second widest of the four options, making it the second-most expensive to maintain. While this option is more attractive with regards to the SFR shift and open space creation than HV-1, it will not be as responsive to those outcomes as HV-3.

At a width of 126 feet, HV-3 will be the narrowest of the proposed viaduct options with the exception of the HV-4 replace-in-kind option. HV-3 will be almost as responsive to safety benefits as HV-2 by providing a usable 8-foot-wide right shoulder. Although not conforming to the interstate design standard of 10 feet for shoulders, the proposed width will be enough for disabled vehicles and first responders to safely pull over out of traffic. HV-3 will require a temporary structure to maintain traffic during construction. This will create temporary impacts, but the permanent impact will be the least of all the options except HV-4.

HV-4, at 113 feet in width, is not responsive to improving safety as no shoulders are provided. FHWA approval of a design exception for failure to meet shoulder requirement must be successfully obtained. To maintain traffic during construction, the largest temporary structure of any of the options would be required.

HV-3 is the preferred option based on the following:

- Improves safety and operations
- Occupies the smallest footprint of proposed highway viaduct except for HV-4
- Exceeds design requirements for shoulder width on long bridges
- Provides for additional open space along the Charles River
- Incurs the second lowest long-term maintenance costs

The evaluation process conducted for the selection of the Preferred Alternative is described in Section 3.1.1, Guiding Criteria for the Development of the Preferred Alternative and the Throat Area Variations.

Central to the purpose for guiding criteria is full consideration and application of sound engineering principles to the myriad ideas and schemes offered by the public and the Task Force. The application of engineering to these ideas assures that public benefit and safety are not excluded, but are fully evaluated.

Engineering consideration of public benefit and safety includes, but is not limited to, evaluation of the following partial list:

- Highway pavement drainage safety
- Vehicular offsets from barrier
- Emergency vehicular accommodation
- Dimensionally compliant pedestrian and bicycle accessibility
- AASHTO, MassDOT, City of Boston and DCR design standards

Rail Operations

Regarding rail operations and rail yard issues under the 3K-HV Variation, the permanent rail yard will provide layover capacity for up to eight train sets in a parallel track arrangement and support facilities for MBTA operations. MBTA revenue service and Amtrak Shore Line East service will operate on two mainline tracks aligned to retain the existing 50 mph Maximum Authorized Speed through the Project Area. MBTA non-revenue movements and freight traffic will operate on two additional through tracks within the rail yard and across West Station to the GJR, merging to a single track at the east and west ends of the Project limits. Track crossovers will be built within the Throat Area to create operational flexibility between the Worcester Main Line tracks, the GJR tracks, and the layover yard. Crossovers will allow an express train to bypass a local train through the Project Area. Maximum speeds through these crossovers would be reduced to 30 mph for short distances. Return crossover tracks are also provided to the west of Cambridge Street. These crossovers will allow trains to pull in or out of the rail yard with minimal impact to revenue service trains.

The rail yard will include a power substation, crew parking area, crew quarters and related utility infrastructure. Under this variation, West Station will consist of three passenger platforms served by four revenue tracks and accessed via a two-level elevated station, as well as an ability to walk up to a south side platform. Vehicles will directly access the station via bridge connections to “Seattle Street Connector” and Cattle Drive” to the north. Pedestrians and cyclists will access the station via separated lanes along the roadway connections to the north, as well as a southern ramp connection to Malvern Street and a switchback ramp connection to Babcock Street. An access gate will be provided at Babcock Street for emergency vehicles to enter the yard from the south.

3.3.2 3K-AMP Variation

This variation removes the 2,500-foot highway viaduct and replaces its function with a partially at-grade/partially below-grade I-90 segment. It uses reduced travel lane widths in comparison to the existing viaduct and places the GJR tracks onto a 2,100-foot-long railroad viaduct stacked above I-90 eastbound. Proceeding west from the vicinity of SFR, the GJR track rises and passes over SFR on a new bridge, continuing to rise on embankment and retained fill on the approach to I-90. Continuing westerly, GJR passes over I-90 westbound on one structure, then passes over I-90 eastbound to an independent structure that continues over I-90 eastbound for the remainder of the Throat Area.

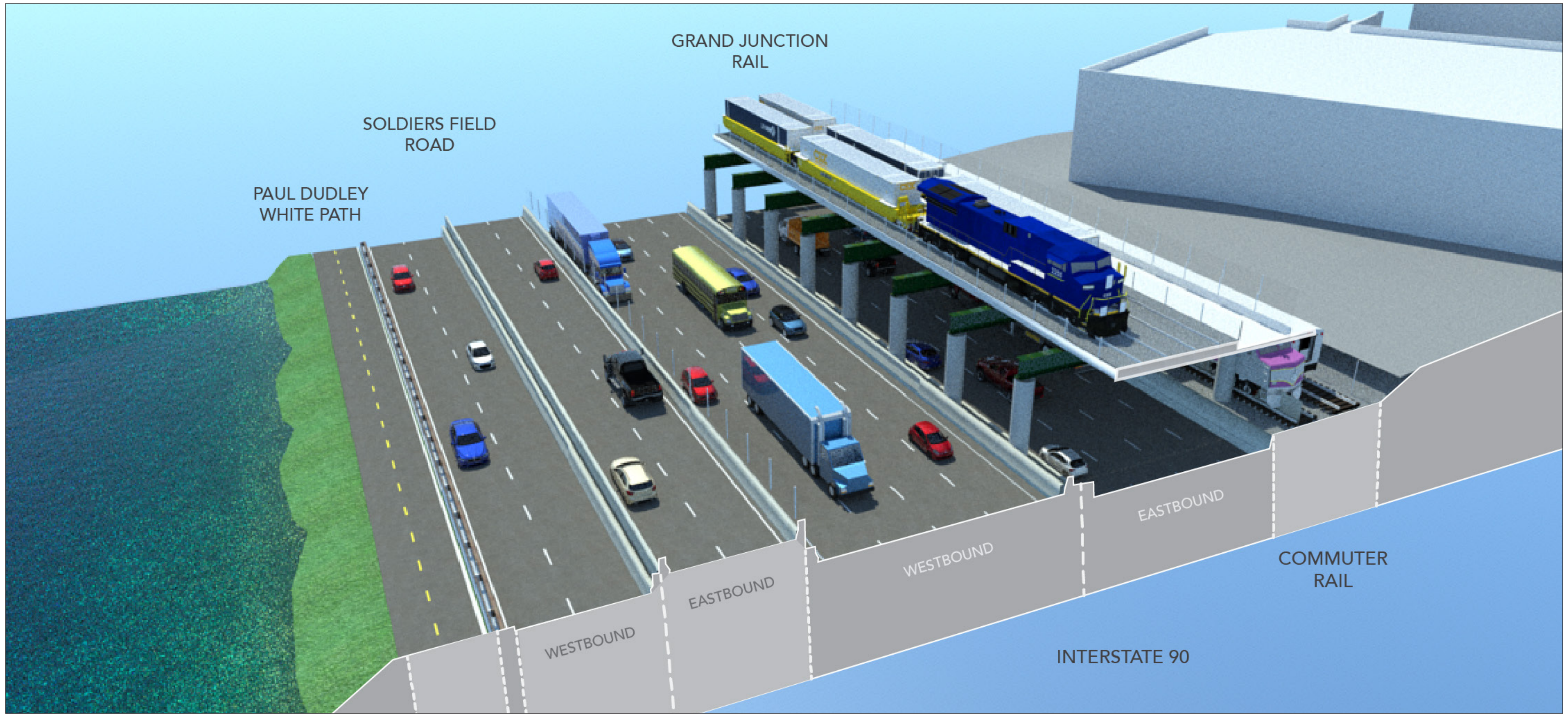
The GJR includes two railroad tracks through the Throat Area and across a new bridge carrying the GJR over SFR. Spacing between the two tracks is 13 feet, with 9-foot-wide clearance lines left and right. The anticipated bridge structure depth over SFR and I-90 westbound will be approximately 6 feet. Bridge depth over I-90 eastbound will be less, at 5 feet, because span lengths will be shorter along the tangent section over I-90. The GJR viaduct structure width is greater than that required to carry just the two GJR tracks because it must span over the entire width of the four eastbound I-90 travel lanes and shoulders. The excess width enables accommodation for a pedestrian/bike path intended to connect proposed West Station to the PDW Path in the vicinity of the BU Bridge.

To enable GJR to pass over I-90 westbound, a portion of I-90 must be constructed below the existing ground elevation. The combination of maximum 1.5% GJR track gradient, highway vertical clearance of 14’-6” below the GJR bridge, and the GJR Bridge depth of approximately 6 feet requires the elevation of the interstate highway section to be several feet below the existing ground surface. Within this part of the Throat Area, the depressed westbound interstate highway section will encounter ground water. A concrete slab and wall section will be required to prevent ground water intrusion into the pavement and drainage systems. The stormwater management system will include a pump station to convey stormwater out of the depressed section.

GJR remains elevated on structure over I-90 eastbound, which reduces the overall transportation infrastructure width in the Throat Area. To reduce the elevation differential to the west where GJR must transition to ground elevation, I-90 eastbound will be depressed several feet below the existing ground elevation. The concrete slab and wall section that is needed for a few hundred feet for the I-90 westbound section will be needed for the entire length of the Throat Area for the I-90 eastbound section, necessitating a significant amount of pumping.

Continuing to the west, beyond the westerly end of the Throat Area and after passing over Track 1 of the Worcester Main Line, GJR descends to an at-grade elevation at the east end of the West Station platforms. The West Station platforms must move approximately 260 feet westerly in comparison to the 3K-HV Variation to accommodate the track length needed to transition to ground elevation.

The two Worcester Main Line tracks, spaced 13 feet between track centerlines with 9-foot-wide clearance lines left and right, will be shifted south and aligned closely adjacent to the east of Buick Street, resulting in the need to acquire approximately 7 feet of BU property. Coordination with BU will be required with respect to the property transaction. Because GJR and the Worcester Main Line tracks will be at different elevations, there would be no crossover capability within the Throat Area, unlike 3K-HV and 3K-ABC. Track 1 of the Worcester Main Line tracks must pass under the GJR viaduct, with 18’-6” railroad clearance, prior to entering the West Station area.



Schematic perspective of Throat Area Variation 3K-AMP looking east

The Track 1 profile elevation transition will be significant enough that it must begin to the east where the two Worcester Line tracks are parallel and adjacent to each other. Because insufficient space will be available between the two tracks to individually transition the profile of just one track, both track profiles must be similarly adjusted to a lower elevation. The resulting depressed railroad track sections will require retaining walls and bottom slabs to prevent ground water from entering. Pump stations to remove stormwater will also be required.

The proposed interstate highway section would provide four 11-foot-wide travel lanes in each direction with 2-foot-wide left and right shoulders eastbound and 3-foot-wide left and right shoulders westbound. The minimum AASHTO design requirements for interstate highways are 12-foot-wide travel lanes, 10-foot-wide right shoulders, increased to 12 feet when truck traffic exceeds 250 Directional Design Hourly Volume (DDHV), and 4-foot-wide left shoulders. On facilities such as I-90 that exceed a total of six travel lanes, the minimum left shoulder width required is 10 feet, increased to 12 feet when truck traffic exceeds 250 DDHV. On this section of I-90, truck traffic volume exceeds 250 DDHV. The variation’s interstate section with substandard travel lane and shoulder widths is intended to minimize the overall width of the design in the Throat Area to minimize or avoid impacts to the Charles River.

The proposed SFR section carries two 10-foot-wide travel lanes in each direction, a 1-foot reduction in travel lane width in each lane in comparison to the existing travel lane widths, and 1-foot-wide shoulders left and right, which match the existing shoulder widths. The travel lane width reductions will minimize the variation’s overall width with the intent of limiting the amount of impact to the Charles River. The alignment of the PDW Path in the 3K-AMP Variation will remain relatively unchanged from existing conditions. Within this segment, by decreasing the I-90 and SFR travel lanes, approximately 0 to 12 feet of additional open space width is created east and west of the 200-foot-long narrower section of the Throat Area. The PDW Path will be in an alignment immediately adjacent to SFR and the width increases from 8.5 to 12 feet, separated by a guard rail. SFR will be realigned as a result of the GJR Bridge replacement providing the opportunity for a new PDW Path connection and creation of additional open space along the Charles River. The new PDW Path connection will be below the reconstructed GJR Bridge and existing BU Bridge along a straight alignment connecting the path on the east side of the BU Bridge, greatly improving bicyclist accessibility. This connection will be in addition to the existing portion of path that runs along the outside of the bridge abutments over the Charles River that is difficult for bicyclists to navigate. The grade differential between GJR and the PDW Path, and the small area available for the connection switch back make ADA compliance a significant challenge.

The 3K-AMP Variation does not include full-width travel lanes and usable shoulders. If the design were to advance similar to 3K-HV travel lanes and shoulders, the section width will encroach into the river by approximately 25 feet, resulting in impacts to resource areas within the Charles River. Under the Chapter 91 Waterways Program, a waterways license will be required for the placement of structures on filled and flowed tidelands and for the placement of a non-water dependent structure over flowed tidelands. Variation 3K-AMP would require the “use” of historic and public parkland properties and require evaluation under Section 4(f). The change in the use of publicly owned parkland, or in ownership from DCR to MassDOT, would also need to be reviewed under Article 97.

To maintain traffic, staged construction of the 3K-AMP Variation will be required. However, in addition to staged construction, some modes of transportation will be suspended and removed from the Throat Area due to insufficient available space to both maintain traffic and build the facilities. The PDW Path will be temporarily closed and pedestrian/bicycle traffic will be detoured for a period of five years. Additionally, GJR service will be temporarily suspended for a period of at least four years. Because freight and commuter rail operations rely on this track connection and an alternative connection is not locally available, the consequences of temporary service termination will be significant. Detour routing of over 100 miles per trip would take train sets and crew out of service for two days to complete the trip and increase cost to current maintenance operations. Any outage of service on the GJR would also require the approval of CSX, which retains a freight easement to run on the line, and of Amtrak.

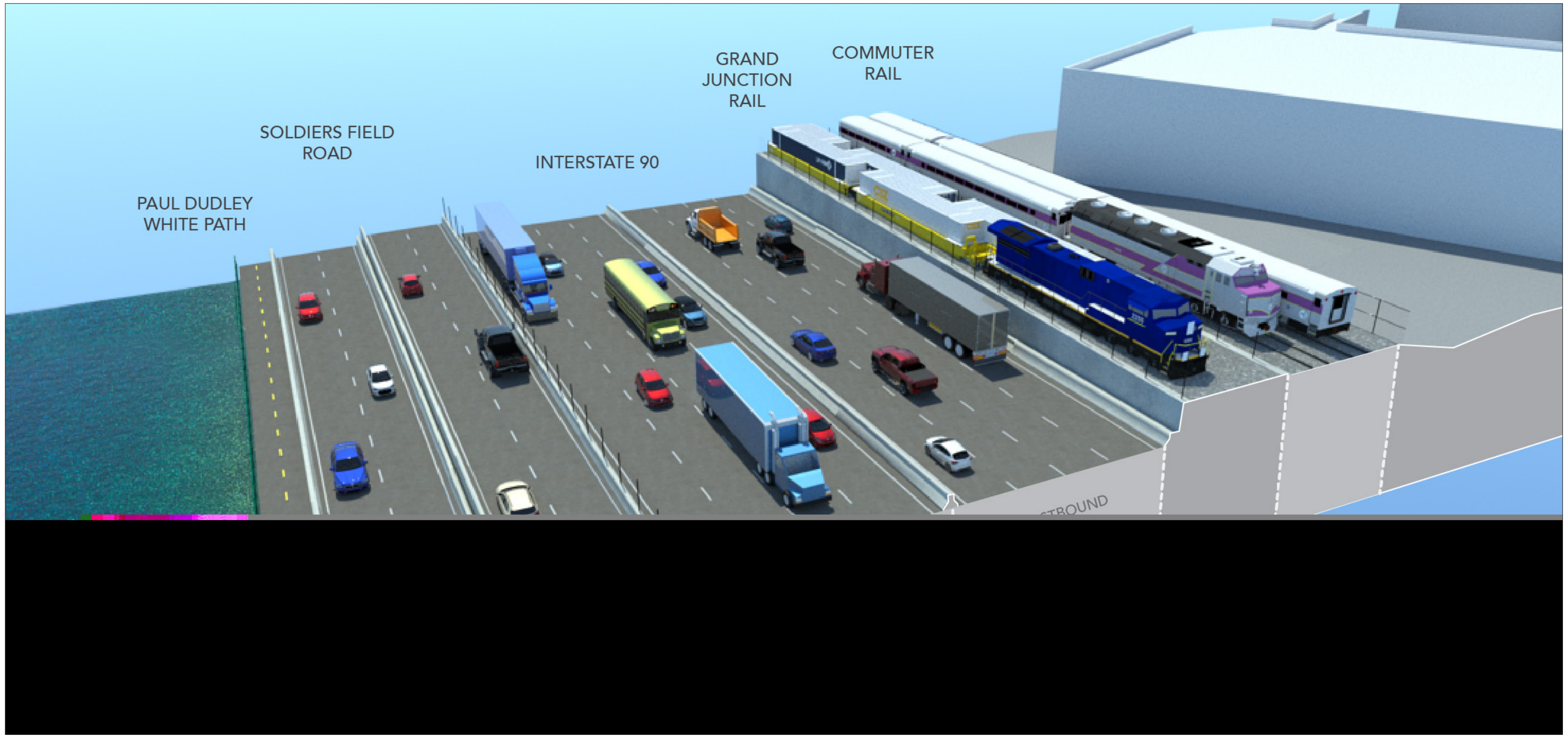
Rail operations

Under the 3K-AMP Variation, West Station must be a two-platform arrangement, with both platforms being center island locations. A key attribute of the 3K-AMP Variation is that passengers would be able to cross a platform to change between a Worcester train and a GJR train. Track 1 would be located on the north side of the north platform, and Track 2 would be located along the south side of the platform. The GJR tracks would occupy the center of the station between the south and north platforms.

In order to reach a satisfactory elevation over I-90, the railroad tracks will begin ascending at the easterly station limit, therefore, the platforms will be located further west than those in the other variations to provide level at-grade passenger boarding before the GJR tracks begin to rise. Because of the retained fill required to carry the GJR tracks between the station and the rail viaduct, the rail yard will not be accessible by emergency vehicles arriving from the south side of the Project Area.

MBTA revenue service and Amtrak Lake Shore East service will operate on two main line tracks through the Project Area. The southerly main line track would be on a similar alignment as the 3K-HV Variation, maintaining existing maximum speeds through the Project Area. However, the outbound track would pass through a broken-back curve within the Throat Area to cross from the southerly side of the Throat Area to the north side of the north platform. Speeds through this broken-back curve would be reduced to 35 mph.

MBTA non-revenue movements and freight traffic will operate on two GJR tracks through West Station eastward across the new railroad bridge over SFR. The two tracks would merge to a single track within the Project Area to meet the single track crossing of the Charles River. Because the GJR tracks will be built on a railroad viaduct, there would be no crossovers between the Main Line tracks and the GJR within the Throat Area. Crossovers between the Main Line and GJR can only occur to the west of Cambridge Street. Express trains would not be able to bypass local trains within the Project Area. Also, trains operating on the GJR will not have direct access to the layover yard.



Schematic perspective of Variation 3K-ABC looking east

3.3.3 Variation 3K-ABC

This Throat Area Variation removes the 2,500-foot I-90 viaduct and replaces its function with a partially at-grade/below-grade I-90 section that provides reduced travel lane widths in comparison to the existing viaduct.

Proceeding west from the vicinity of SFR, similar to Variation 3K-AMP, the GJR track rises and passes over SFR on a new bridge, continues rising on embankment and retained fill, and then passes over I-90 westbound. Unlike Variation 3K-AMP, GJR continues eastbound on another new bridge structure curving to the right, then descends in a straight alignment between I-90 and the Worcester Main Line on a 700-foot-long retained fill section until the track is at grade and adjacent to the Worcester Main Line at about the same elevation. Similar to 3K-AMP, replacement of the historic GJR Bridge over SFR will be required because the length of track required for the railroad to rise and pass over I-90 at the maximum 1.5% grade exceeds the available length between I-90 and the existing SFR bridge.

The GJR component of the variation includes two railroad tracks for an envisioned urban rail transit service. Spacing between the two tracks will be 13 feet, with 9-foot-wide clearance lines left and right. The anticipated bridge structure depth over SFR and I-90 will be approximately 6 feet.

To enable GJR to pass over I-90, a portion of I-90 will be constructed below existing ground elevation. The combination of maximum 1.5% GJR track gradient, highway vertical clearance of 14’-6” below the GJR Bridge, and the GJR Bridge depth of 6 feet will require the elevation of I-90 to be several feet below existing ground surface for a distance of several hundred feet. Within this part of the Throat Area, the depressed I-90 will encounter ground water. A concrete slab and wall section will be required to prevent ground water intrusion into I-90 pavement and drainage systems. The stormwater management system will include a pump station to convey stormwater out of the depressed area. The extent of pumping need will be less than that required by the 3K-AMP Variation.

Similar to the 3K-AMP Variation, the proposed I-90 section carries four 11-foot-wide travel lanes in each direction and 2-foot-wide left and right shoulders. It will not meet minimum AASHTO design requirements for interstate highways. See Section 3.1 for a discussion of this issue.

The two Worcester Main Line tracks, spaced 13 feet between track centerlines with 9-foot-wide clearance lines left and right, will be shifted south and aligned closely adjacent to Buick Street, resulting in approximately 7 feet of BU property acquisition. The southerly shift will minimize the transportation corridor width of the alternative with the intent of limiting the amount of impact to the Charles River. Coordination with BU will be required with respect to the property transaction. A new retaining wall will be required along Buick Street to tighten the Main Line alignment. This retaining wall will be continued eastward due to elevation differences between the realigned tracks and the fire lane along BU buildings.

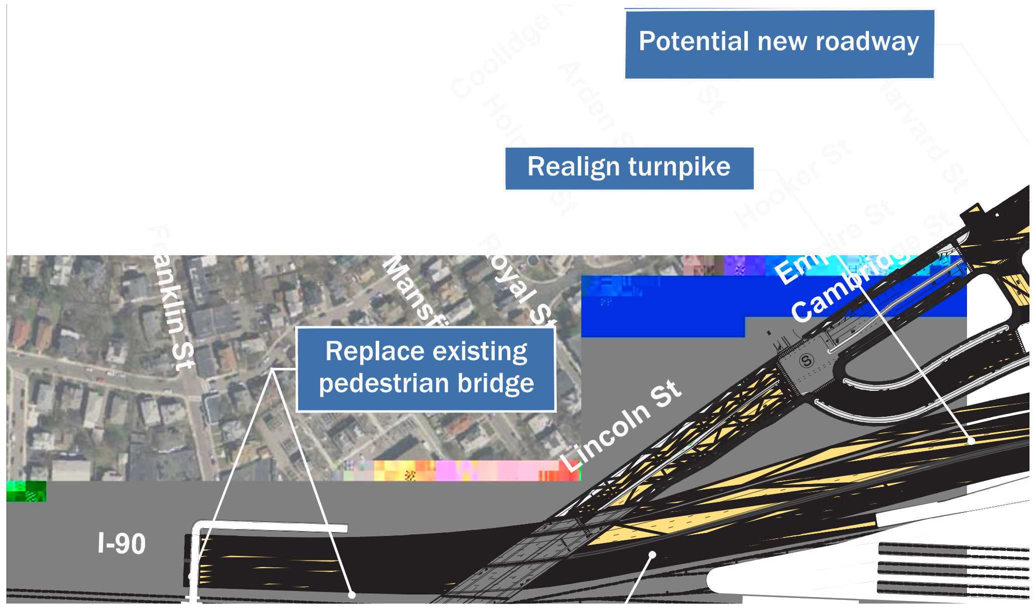
and removed from the Throat Area due to insufficient space available to both maintain traffic and build the facilities. The PDW Path requires temporary intermittent closures for path relocations. Additionally, GJR service must be temporarily suspended for a period of at least 3 years. Because freight and commuter rail operations rely on this track connection, and an alternative connection will not be locally available, the consequences of temporary service termination will be significant. Detour routing of over 100 miles per trip would take train sets and crew out of service for two days to complete the trip and increase cost to current maintenance operations.

Any outage of service on the GJR would also require the approval of CSX, which retains a freight easement to run on the line, and of Amtrak.

Rail Operations

Under the 3K-ABC Variation, West Station would be constructed and operate in an identical manner as 3K-HV. The rail yard will include four permanent tracks with layover capacity for up to eight train sets in a parallel track arrangement and support facilities for MBTA operations. The rail yard will include a power substation(s), maintenance crew parking areas and related utility infrastructure. Vehicles will directly access the station via bridge connections to the north. Pedestrians and cyclists will access the station via separated lanes along the roadway connections to the north, as well as a southern ramp connection to Malvern Street and a switchback ramp connection to Babcock Street. An access gate will be provided at Babcock Street for emergency vehicles to enter the yard from the south.

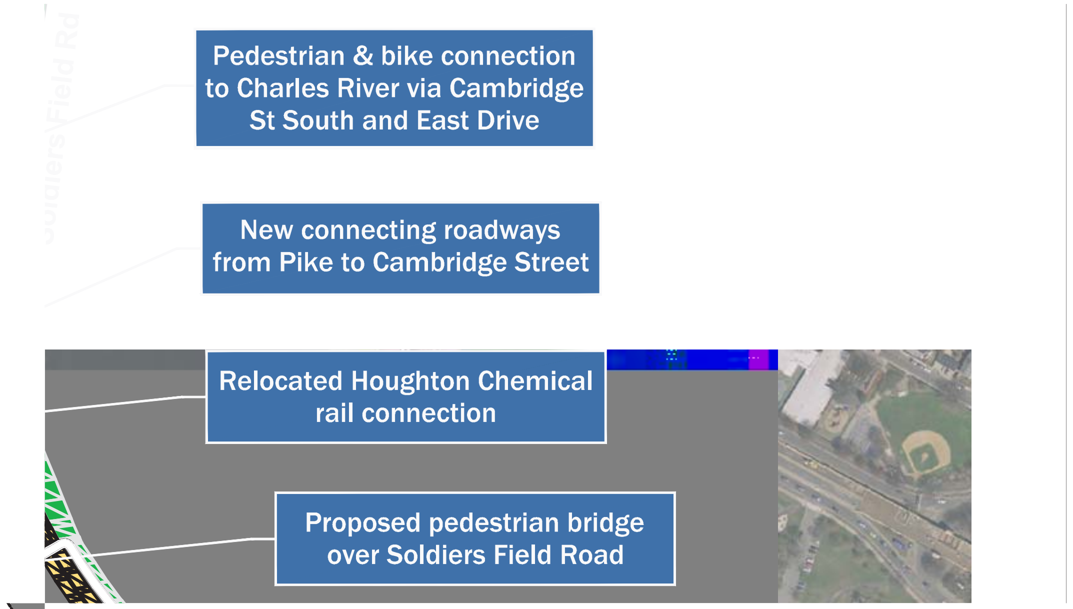
MBTA revenue service and Amtrak Lake Shore East service will operate on two Main Line tracks through the Project Area to maintain the existing 50 mph Maximum Authorized Speed. MBTA non-revenue movements and freight traffic will operate on the two parallel GJR tracks within the Throat Area, merging to a single track before reaching the Charles River Bridge. Track crossovers will be built within the Throat Area to create operational flexibility between the Main Line tracks and the GJR. However, the crossover tracks between the Main Line and the GJR will be further west than under 3K-HV because of the physical limits of the GJR retained earth structure. Crossover between the Main Line and the GJR will be limited to 20 mph due to the shorter angle needed to fit these crossovers as compared to 3K-HV. 3K-ABC also shortens the distance between successive crossover tracks between the Main Line and the layover yard. Shorter distances between crossovers mean that a train may not clear the track it departs from before reaching the next crossover, thereby occupying up to three tracks at once. 3K-ABC allows for express trains to bypass local trains within the Throat Area, but at slower speeds than 3K-HV. R



Potential new roadway

Realign turnpike

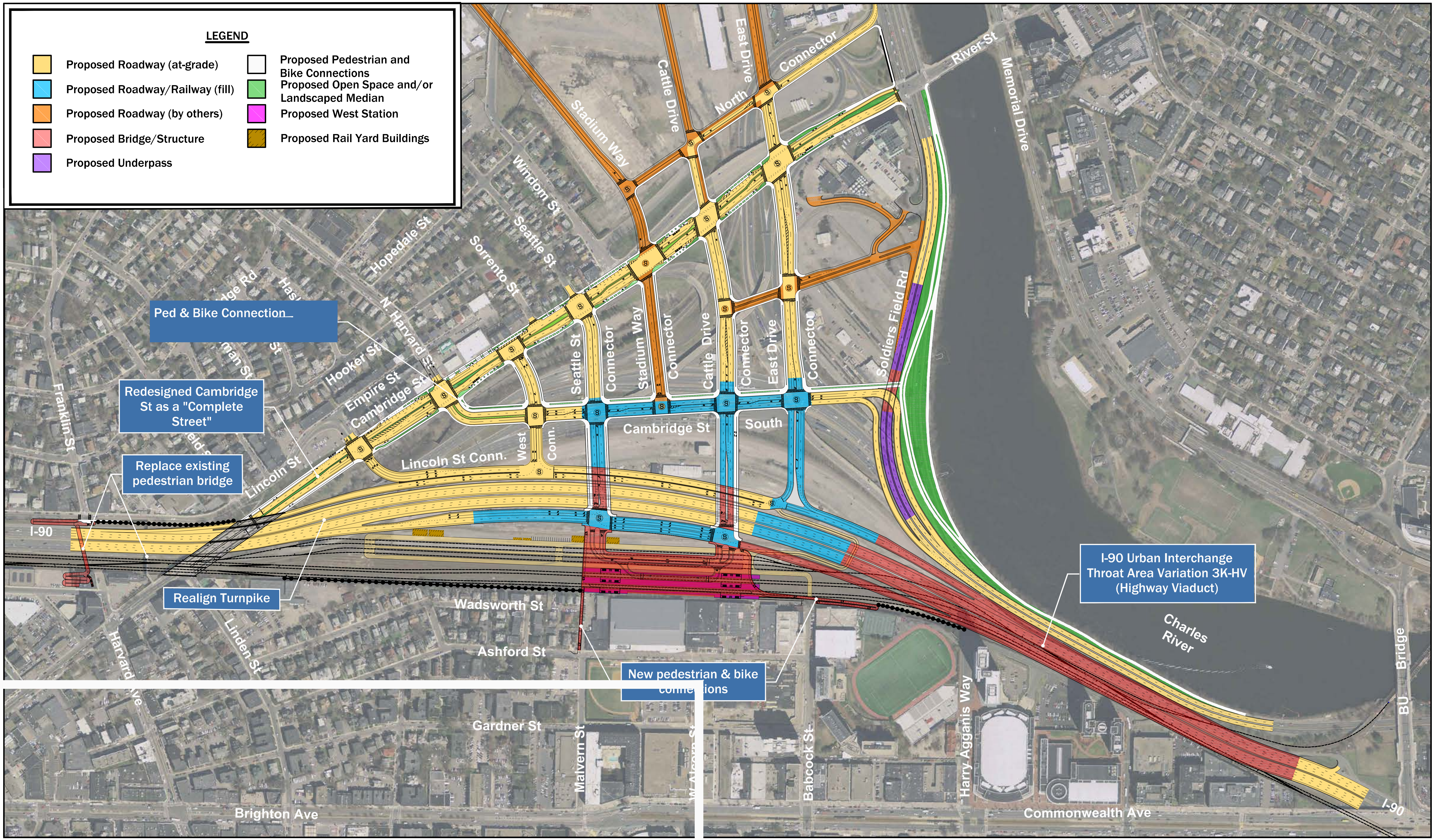
Replace existing pedestrian bridge


Pedestrian & bike connection to Charles River via Cambridge St South and East Drive

New connecting roadways from Pike to Cambridge Street

Relocated Houghton Chemical rail connection

Proposed pedestrian bridge over Soldiers Field Road


Stadium Way
Cattle Drive
East Drive
Connector
North
River St
Memorial Drive
Windom St
Seattle St
Hopedale St
Sorrento St
Soldiers Field Rd
Hooker St
Empire St
Cambridge St
N Harvard St
Franklin St
Lincoln St
Seattle St
Connector
Stadium Way
Connector
Cattle Drive
Connector
East Drive
Connector
Cambridge St
South
Lincoln St Conn.
West
Conn.
I-90
Wadsworth St
Ashford St
Linden St
Harvard Ave
Gardner St
Malvern St
Babcock St
Harry Agganis Way
Brighton Ave
Commonwealth Ave
Charles River
BU Bridge
I-90
N
0
200
400
Feet

LEGEND

🟨	Proposed Roadway (at-grade)
🟦	Proposed Roadway/Railway (fill)
🟧	Proposed Roadway (by others)
🟥	Proposed Bridge/Structure
🟪	Proposed Underpass
⬜	Proposed Pedestrian and Bike Connections
🟩	Proposed Open Space and/or Landscaped Median
🟪	Proposed West Station
🟫	Proposed Rail Yard Buildings

Ped & Bike Connection

Redesigned Cambridge St as a "Complete Street"

Replace existing pedestrian bridge

Realign Turnpike

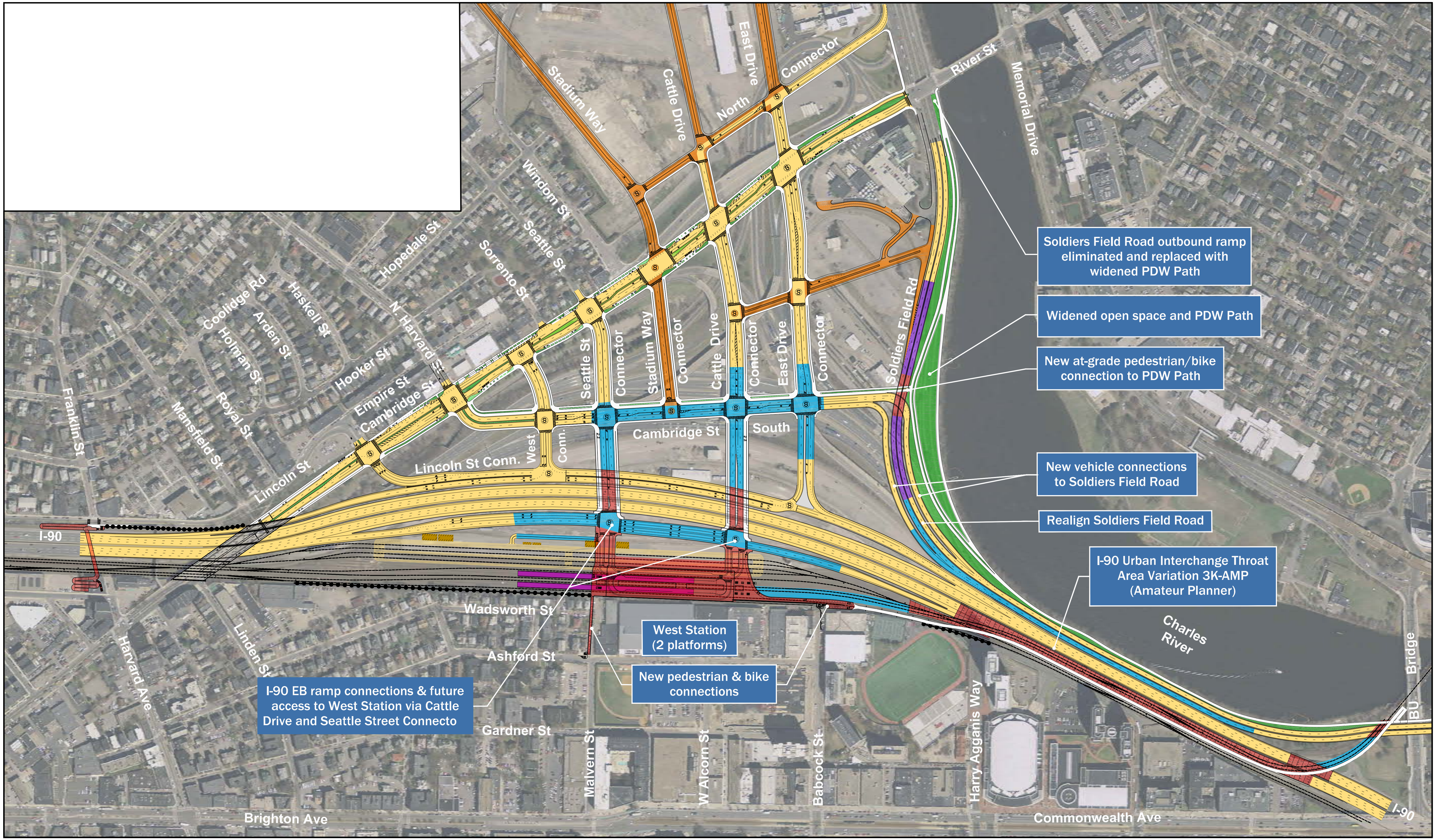
New pedestrian & bike connections

I-90 Urban Interchange Throat Area Variation 3K-HV (Highway Viaduct)

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE
3-2

2040 Design Year
I-90 Urban Interchange, 3K-HV


Stadium Way
Cattle Drive
East Drive
Connector
North
River St
Memorial Drive
Windom St
Seattle St
Hopedale St
Sorrento St
Coolidge Rd
Haskell St
Arden St
Holman St
N. Harvard St
Hooker St
Empire St
Cambridge St
Franklin St
Mansfield St
Royal St
Lincoln St
Lincoln St Conn.
West
Conn.
Seattle St
Connector
Stadium Way
Connector
Cattle Drive
Connector
East Drive
Connector
Soldiers Field Rd
Cambridge St
South
I-90
Wadsworth St
Ashford St
Linden St
Harvard Ave
Gardner St
Malvern St
W Alcorn St
Babcock St
Harry Agganis Way
Brighton Ave
Commonwealth Ave
Charles River
Bridge
BU
I-90
S

Soldiers Field Road outbound ramp eliminated and replaced with widened PDW Path

Widened open space and PDW Path

New at-grade pedestrian/bike connection to PDW Path

New vehicle connections to Soldiers Field Road

Realign Soldiers Field Road

I-90 Urban Interchange Throat Area Variation 3K-AMP (Amateur Planner)

West Station (2 platforms)

New pedestrian & bike connections

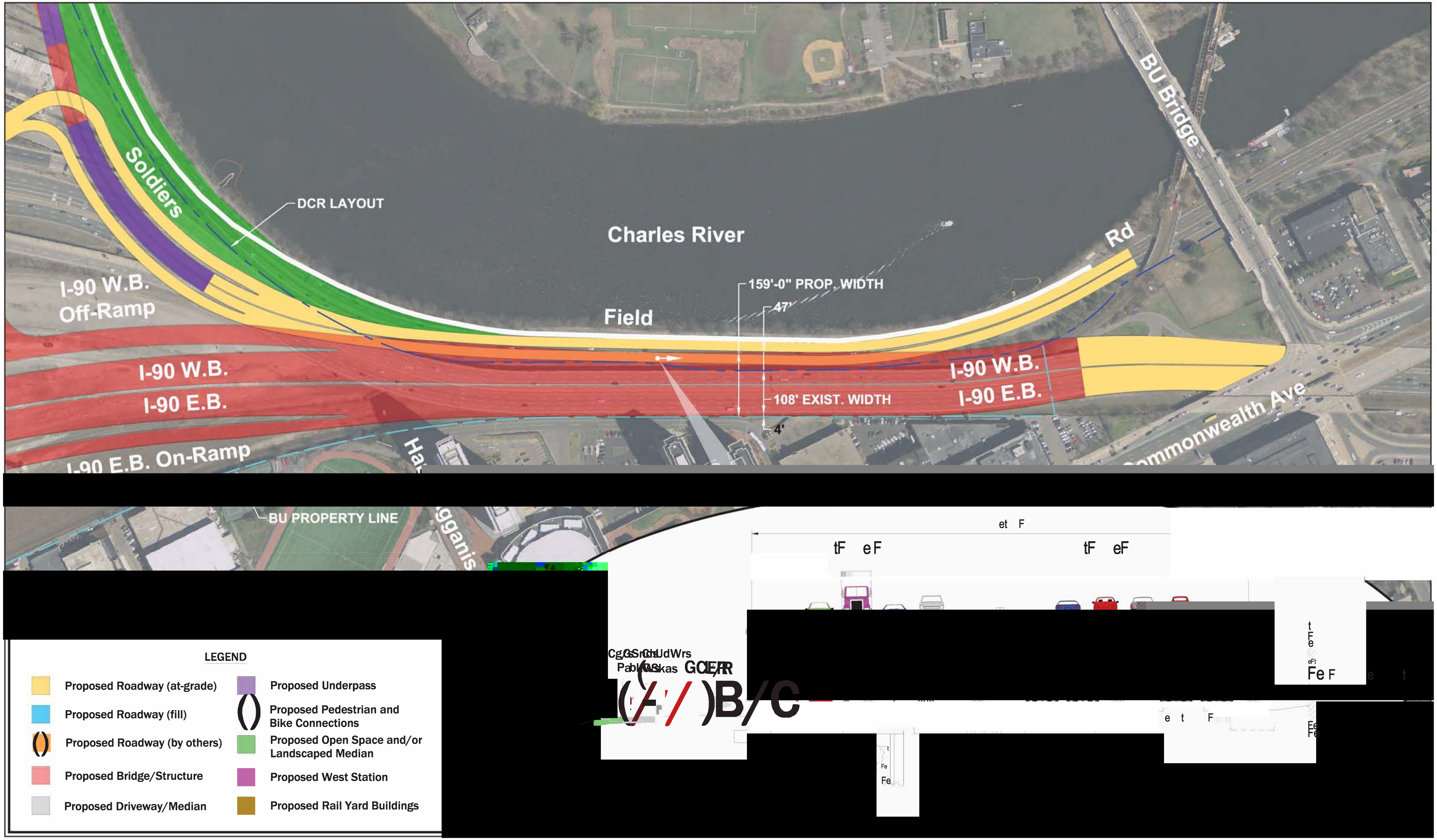
I-90 EB ramp connections & future access to West Station via Cattle Drive and Seattle Street Connecto

0 200 400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

2040 Design Year
I-90 Urban Interchange, 3K-AMP

FIGURE
3-3


Soldiers
DCR LAYOUT
Charles River
BU Bridge
Rd
159'-0" PROP. WIDTH
47'
Field
I-90 W.B. Off-Ramp
I-90 W.B.
I-90 E.B.
I-90 W.B.
I-90 E.B.
108' EXIST. WIDTH
4'
I-90 E.B. On-Ramp
Commonwealth Ave
BU PROPERTY LINE
Harry Agganis

[redacted]

[redacted]

[redacted]

LEGEND

🟨 Proposed Roadway (at-grade)
🟦 Proposed Roadway (fill)
🟧 Proposed Roadway (by others)
🟥 Proposed Bridge/Structure
⬜ Proposed Driveway/Median
🟪 Proposed Underpass
▨ Proposed Pedestrian and Bike Connections
🟩 Proposed Open Space and/or Landscaped Median
🟪 Proposed West Station
🟫 Proposed Rail Yard Buildings

[redacted]

0
80
160
Feet

Soldiers
DCR LAYOUT
BU Bridge
BU PROPERTY LINE
gganis Way
126'-9" Out To Out
I-90 WB - 4 Lanes
I-90 EB - 4 Lanes
Additional Open Space (9'± Average)
Dr. Paul Dudley White Path
Existing River Bank
SFR WB
SFR EB
DCR Layout
Stormwater BMP
Prop. G.J. Tracks
MBTA Commuter Rail
Track 5
Track 3
Track 1
Track 2
Building
Existing MWRA Sewer

[redacted]

LEGEND

- 🟨 Proposed Roadway (at-grade)
- 🟦 Proposed Roadway (fill)
- 🟧 Proposed Roadway (by others)
- 🟥 Proposed Bridge/Structure
- ⬜ Proposed Driveway/Median
- 🟪 Proposed Underpass
- ⬜ Proposed Pedestrian and Bike Connections
- 🟩 Proposed Open Space and/or Landscaped Median
- 🟪 Proposed West Station
- ▨ Proposed Rail Yard Buildings

INTERSTATE 90 ALLSTON INTERCHANGE

massDOT Massachusetts Department of Transportation Highway Division

0 80 160
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE
3.3-3

Highway Viaduct Concept 3K Option HV-3

Soldiers
DCR LAYOUT
BU Bridge
BU PROPERTY LINE
ganis Way
113'-0" Out To Out
I-90 WB - 4 Lanes
I-90 EB - 4 Lanes
Additional
Open Space (20'±)
Dr. Paul Dudley
White Path
Existing
River
Bank
SFR WB
SFR EB
DCR Layout
Prop. G. J. Tracks
MBTA Commuter Rail
Existing MWRA Sewer
LEGEND
Proposed Roadway (at-grade)
Proposed Roadway (fill)
Proposed Roadway (by others)
Proposed Bridge/Structure
Proposed Driveway/Median
Proposed Underpass
Proposed Pedestrian and Bike Connections
Proposed Open Space and/or Landscaped Median
Proposed West Station
Proposed Rail Yard Buildings

[redacted]

[redacted]

INTERSTATE 90
ALLSTON
INTERCHANGE

massDOT
Massachusetts Department of Transportation
Highway Division

0 80 160
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

Highway Viaduct Concept 3K
Option HV-4

FIGURE
3.3-4

4 Affected Environment

This chapter describes the character of the environment in which the I-90 Allston Interchange Project will exist. It documents the affected environment for the Project relative to applicable environmental resources including the natural and built environments present in the Project Area. This chapter also addresses requirements specified in the Secretary's Certificate on the Project Environmental Notification Form (ENF). In addition, this chapter provides context for understanding the potential impacts of the Project. The Project Area consists of major features including the I-90 Interchange in Allston and railroad infrastructure within Beacon Park Yard (BPY).

I-90 Interchange

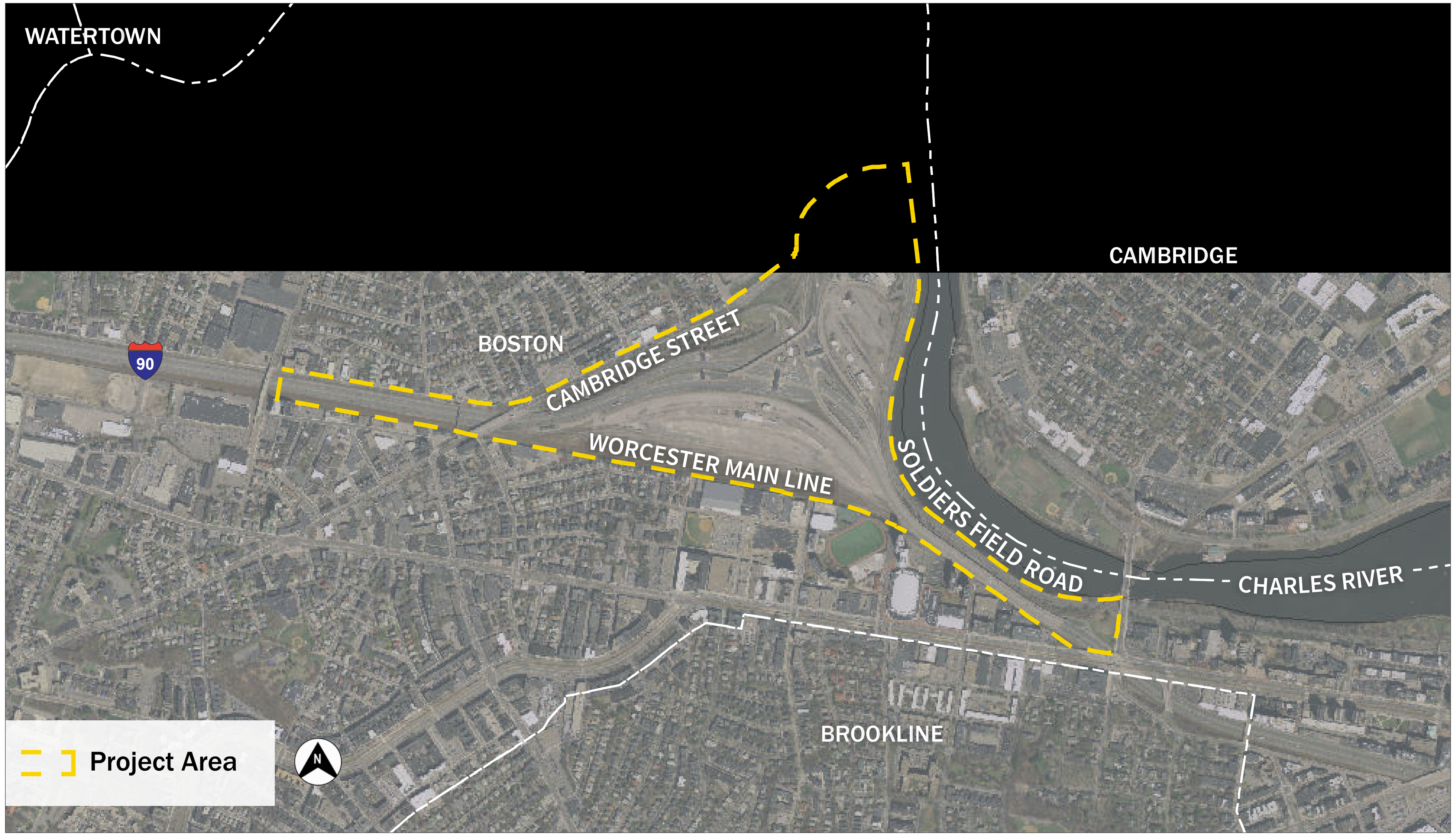
The I-90 Allston Interchange (Exits 18, 19 and 20) is situated within the urban core of the Boston Metropolitan Area and on the primary east-west highway corridor in the state. The interchange provides northerly connections to and from Cambridge, Allston and local roadways to I-90. I-90 is one of the busiest highways in Massachusetts. On a typical weekday, it serves approximately 154,000 vehicles in the vicinity of the Allston Interchange. Approximately 65,000 to 70,000 vehicles per weekday use the Allston Interchange ramps to access or egress I-90. The majority of the daily trips are commuters traveling to and from Boston and Cambridge. However, I-90 also carries a significant amount of commercial truck traffic, approximately 8,000 trucks per day. This is due largely to the fact that I-90 runs the entire length of the state, serves major cities (i.e., Worcester), and connects directly with other interstate highways (I-95, I-495, I-290, I-84 and I-91) that bring goods to the region from other parts of the state and the country.

Most of the existing I-90 interchange dates from the original construction of the Boston Extension of I-90 in the 1960s, but with the fairly recent conversion of the toll system to All Electronic Tolling (AET) and associated removal of the existing toll booths and support facilities, interim horizontal and vertical alignments of I-90 through the interchange have been improved to a limited extent. Though improved, the interchange's cross-sectional elements still do not meet current interstate highway design standards. I-90 carries four travel lanes in the eastbound direction and four travel lanes in the westbound direction, both east and west of the I-90 interchange. Within the interchange, the number of lanes in the eastbound direction and in the westbound direction decreases to three, with the dropped fourth lane in each direction acting essentially as an exit-only lane.

Soldiers Field Road

Soldiers Field Road (SFR) is a parkway that is a part of the Massachusetts Department of Conversation and Recreation's (DCR) Charles River Basin Historic Parkway System. SFR follows an alignment adjacent to the south bank of the Charles River from Beacon Street (near Watertown) in Brighton to the Boston University (BU) Bridge in Allston where it connects to Storrow Drive.

SFR provides connectivity between downtown Boston and suburbs to the west (Allston, Brighton, Cambridge, Watertown, etc.), as well as connectivity with the I-90 interchange in Allston and other major arterial roadways in the area such a Cambridge Street, Western Avenue and Fresh Pond Parkway. Because of this connectivity, SFR serves an important regional function for commuters, which is why there are approximately 70,000 vehicles per day using the facility (eastbound plus westbound).



Project Area

In the vicinity of the Project Area, SFR typically has a four lane cross-section separated by a median with guard rails. There are existing on- and off-ramps serving the Project Area at Cambridge Street/River Street, Western Avenue and North Harvard Street. Trucks, buses and other commercial vehicles are prohibited from using SFR. The Dr. Paul Dudley White Bike Path (PDW Path) is located within the Charles River Reservation between SFR and the Charles River. The path serves pedestrians, bicyclists and other recreational users.

Rail Operations

Rail Yard

The rail yard is located adjacent to the Worcester Main Line, bounded by I-90 to the north and the main line track to the south. Since the 19th century, this approximately 30-acre site served CSX and legacy railroads as a major freight rail yard and intermodal terminal in Boston.

The rail yard currently has six layover tracks, adjacent to the Worcester Main Line right-of-way (ROW). The rail yard ties to the Worcester Main Line at both the west and east ends of the yard, and to the single-track Grand Junction Railroad (GJR) at the east end of the yard. The west side of the existing rail yard ties to the Worcester Main Line just west of the Cambridge Street Bridge, and the east side of the existing rail yard ties to the Worcester Main Line through crossovers located in the Throat Area.

Worcester Main Line

The two-track Worcester Main Line runs through the southern part of the Project Area. From west to east, the Worcester Main Line is located south of I-90. It passes under the Cambridge Street Bridge, continues straight between the rail yard and developed land to the south, and curves south to continue underneath the I-90 viaduct through the Throat Area.

A rail spur to Houghton Chemical Corporation branches off the Worcester Main Line and the GJR in the Throat Area, runs north between I-90 and SFR, and terminates in the northeast portion of the Project Area. The rail spur will cease operation by spring 2019.

Grand Junction Railroad

The GJR is a single-track branch from the Worcester Main Line that leads through Cambridge, the Massachusetts Institute of Technology (MIT) campus, and to the north of Kendall Square to connect to the Massachusetts Bay Transportation Authority (MBTA) Commuter Rail Maintenance Facility and the Fitchburg Line, approximately two miles from the rail yard. The GJR runs beneath the I-90 viaduct, over SFR on a two-span bridge, and over the Charles River on a multi-span bridge that passes beneath the BU Bridge. To access the GJR from the Worcester Main Line, the current track configuration requires trains to enter the rail yard. In the Throat Area, the single-track GJR connects to the Worcester Main Line through crossover tracks from the rail yard.

4.1 Geology, Topography and Soils

Geology

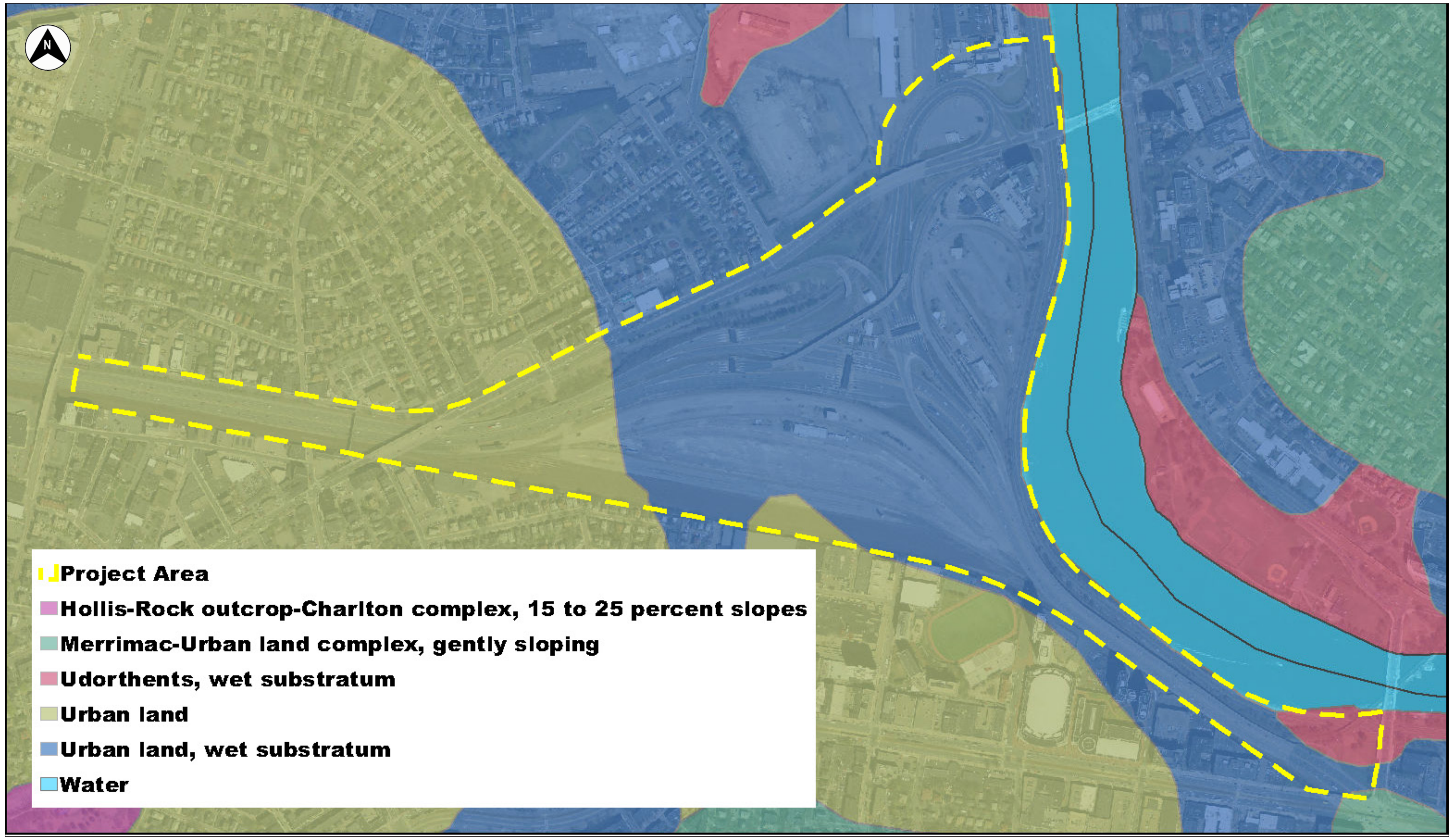
Geology is the study of the earth's physical structure and conditions below the ground surface. Geologic conditions describe rock and soil conditions below ground. Geologic conditions are important to engineering design in order to characterize the ground's capabilities to support the weight of highway structures above the ground surface. The geologic conditions are evaluated, and the highway and associated man-made features are designed to make sure the weight is properly supported.

Within the Project Area, the geology primarily consists of sand and gravel overlying coastal plain deposits. Based on review of the National Geologic Map Database of Massachusetts published by the U.S. Geological Survey (USGS), the Project Area is underlain by the Wamsutta Formation. Bedrock in the Project Area consists of Cambridge Argillite, characterized as gray argillite and minor quartzite, rare sandstone and conglomerate. Surficial geology primarily consists of sand and gravel overlying coastal plain deposits.

Topography

Topography represents the dimensional physical characteristics of land surface, such as the height and shape of the landscape. It is generally expressed in feet as an elevation of the ground surface or height above a fixed reference point. The fixed reference point is sea level, or zero feet, and all surface features are measured relative to mean sea level. The Project survey plans show elevations of the ground surface in feet above sea level and labeled as contours. The topography or elevation of the ground surface in the Project Area is generally flat; further east toward the Charles River, there is a change in topography to a lower elevation at the river.

The topographic features of the entire Project Area were obtained by a field survey. General elevations throughout the Project Area vary with elevations in the rail yard ranging between 20 feet to 17 feet (North American Vertical Datum of 1988, NAVD88). Further north in the former toll area, the elevation is 14 feet. Grades transition to lower elevations continuing east, with SFR at approximately elevation 10 feet. A grassed area adjacent to the PDW Path along SFR is at elevation 8.5 feet, transitioning to elevation 7 feet along the top of the slope adjacent to the Charles River. The highest elevation within the Project Area is located on the overhead ramps at elevation 24 feet; the lowest elevation is along SFR at the foot of the BU Bridge, at elevation 4.5 feet.


N
Project Area
Hollis-Rock outcrop-Charlton complex, 15 to 25 percent slopes
Merrimac-Urban land complex, gently sloping
Udorthents, wet substratum
Urban land
Urban land, wet substratum
Water

Graphic 4.1-1: MassGIS Soils Datalayer

Soils

Soil consists of the top layer of the earth's surface in which plants grow. It is comprised of rock and mineral particles mixed with decayed organic matter. Soil is characterized by its depth and thickness, color, moisture and dryness, texture, structure, content of rock fragments and mineral composition.

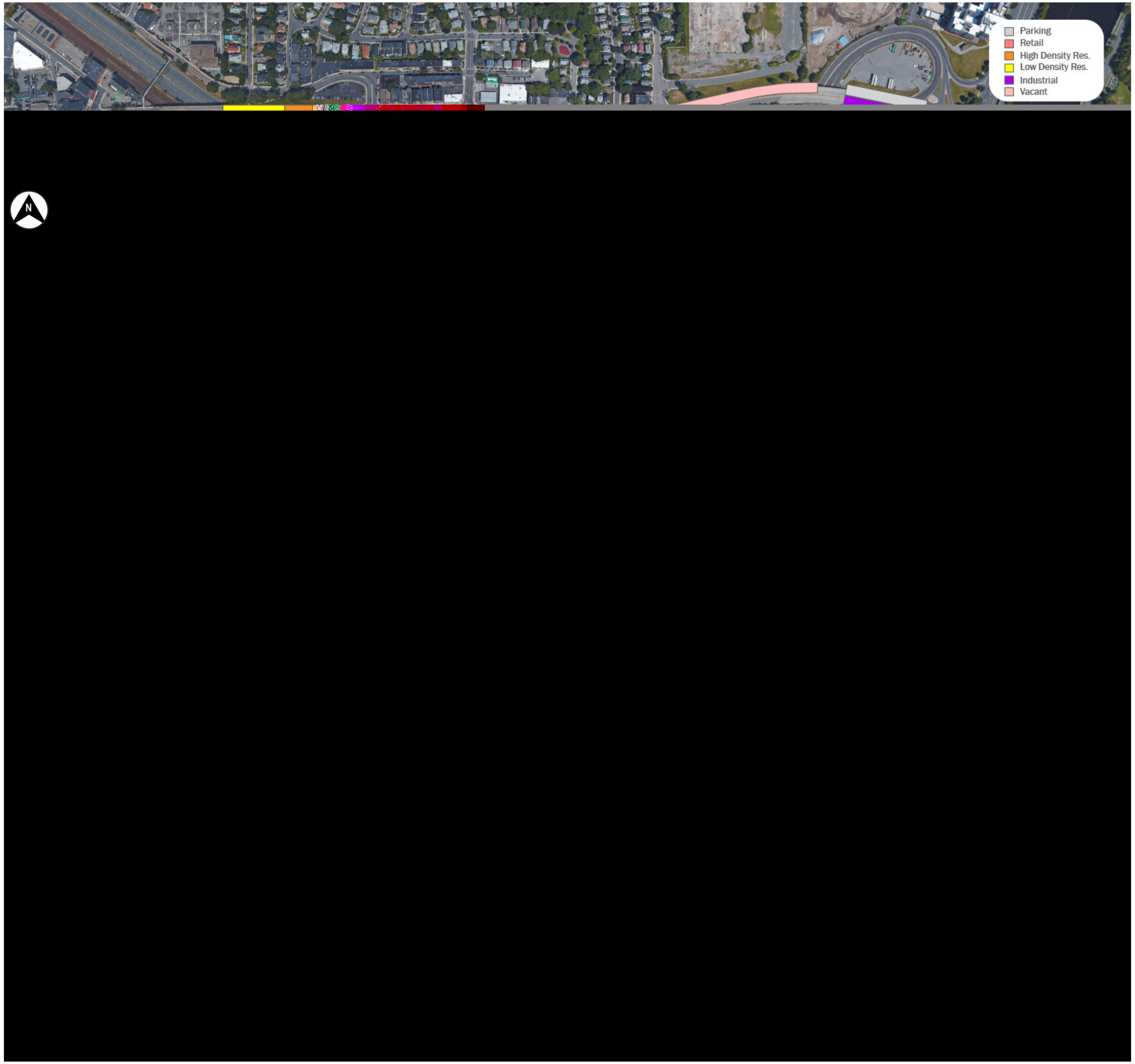
Geotechnical engineers examine soil conditions to determine the types and thickness of soil layers and the location of the groundwater, and to define any environmental concerns. Soil samples are extracted by digging or drilling into the ground to get soil samples for laboratory testing and analysis. This information is used to develop a soil profile to determine the materials and design of highway support structures below the ground surface.

Based on a review of the MassGIS soil data layer, (see Graphic 4.1-1), the predominant soil types within the Project Area include urban land and small areas of disturbed soils, where the upper soil material has been removed or altered. These soils are called Udorthents.

Urban land is land mostly covered by pavement, streets, parking lots, buildings and other industrial areas typical of a city environment. Urban land covers more than 75% of the land surface in the Project Area.

Throughout most of the Project Area and rail yard, the predominant soil type is urban land with wet soils below and gentle slopes (wet substratum, 0 to 3% slopes). The wet substratum indicates that the area was previously tidal marshes, river flood plains, bays, harbors and swamps. These areas were filled in with rubble, refuse and mixed soil material, typically sand and gravel. Based on historical maps, seasonal high groundwater elevations range from 7 feet to 1 foot from the western to eastern limits of the Project Area.

In addition, urban land with steeper slopes (0 to 15% slopes) is located throughout the western portion of the rail yard and covers much of the BU campus from just east of Malvern Street to Buick Street. This soil type extends to the west of Malvern Street and covers much of the residential area north and south of I-90.



Graphic 4.2-1: Key Map and Inserts Showing Land Use

4.2 Land Use and Zoning

Regional Context

As shown on Graphic 4.2-1, the Project Area is adjacent to the commercial and residential portion of the Allston neighborhood of Boston. It is located due west of downtown Boston; to the south is Brookline and to the west is Brighton. The area contains educational institutions including Harvard University and BU. Most of the land within the Project Area is presently owned by Harvard University Beacon Yards LLC, an entity controlled by Harvard University, with the existing I-90 interchange and railroad facilities operated by the MBTA and the Massachusetts Department of Transportation (MassDOT) under easements. Figure 4.2-1 shows existing ownership and easements within the Project Area.

The Allston neighborhood includes a high concentration of students, making it the neighborhood with the highest population of young adults in the city. I-90 and the CSX rail lines traverse the Project Area from east to west in the southern portion of Allston. Allston is bordered by the Charles River, which separates it from the City of Cambridge to the north. It is also split in two by I-90. The area north of I-90 near BPY is often referred to as “Lower Allston.” A substantial part of the Harvard University campus is in Lower Allston, including the Harvard Business School and most athletic facilities.

The Project Area is triangular in shape and bound on the east by SFR, the PDW Path and the Charles River. On the north, it is bound by the North Allston neighborhood and Harvard University, and on the south, by Allston Village, BU and the neighborhoods of North Brookline. The Allston neighborhoods are characterized by a mix of single-family, multi-family and apartment residences including many wooden triple-deckers. The residences in this section of North Brookline are predominantly single-family mixed with apartment buildings on the major streets. There are several commercial corridors in the surrounding neighborhoods, principally Harvard Avenue, Commonwealth Avenue and Cambridge Street. Both Harvard University and BU have filed Institutional Master Plans (IMPs) with the City of Boston, and these are addressed later in this section.

Extending from the southeast corner of the triangle to the BU Bridge is a sliver of land known as “the Throat,” in which I-90 is tightly bound by BU on the south, SFR, the PDW Path and the Charles River. This section of the Project Area, the Charles River Reservation, is discussed in the Open Space section.

The land uses contiguous to the north and south legs of the triangle are the only areas immediately adjacent to the Project Area that are significantly developed. Other areas immediately adjacent include the Charles River and transportation corridors. Along the north side of Cambridge Street, (photograph insert 1), directly across from the Project Area and extending approximately 4,500 feet, are a mix of uses: residential, surface parking, auto-related commercial, retail, vacant land and highway ROW. The 670-foot residential frontage represents 15% of the total length. The sole retail establishment is a liquor store on the corner of Cambridge Street and North Harvard Street. Surface parking, vacant land and highway ROW comprise approximately 40% of the total street frontage facing the Project Area (photograph insert 2). Along the 4,000-foot-long south border of the Project Area south of the Worcester Main Line, 50% of the length is bordered by institutional uses (BU), 30% by residential uses and 20% by commercial uses.

Historic Land Use

The Project Site, carved originally from Charles River salt marshes and freshwater fields, was transformed in the mid-1860s into Beacon Trotting Park. The park occupied the site until the early 1890s. It was sold to the Boston and Albany Railroad for conversion to a freight yard with two large roundhouses. By early 1957, the toll road from the western border of the state to Route 128 was completed. What was called the Massachusetts Turnpike Boston Extension broke ground on March 5, 1962. According to *The Massachusetts Turnpike: Metropolitan Highway System/Traffic and Revenue Study*, a portion of BPY was acquired by the Turnpike Authority, and the first stage from Route 128 to the Allston/Brighton Toll Plaza was opened in September 1964. The second section, from the Allston/Brighton Toll Plaza to I-93 in downtown Boston, was opened on February 18, 1965.

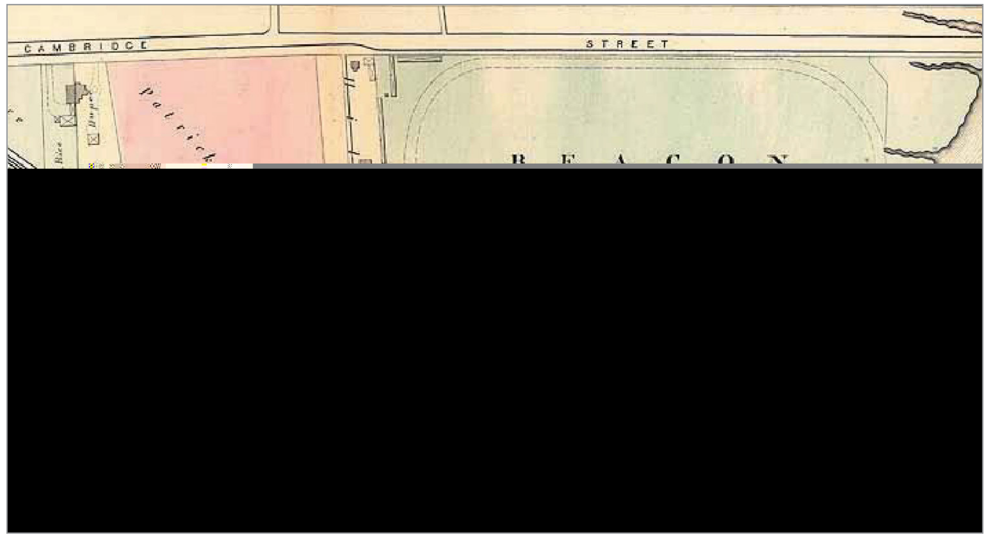
Freight operations at the yard have since ceased, and the exit was recently reconfigured to accommodate the conversion from toll fare collection plazas to electronic tolling. The site today retains some of the character it has always known, as a large open space in single use ready once again to be transformed.

Current Land Use

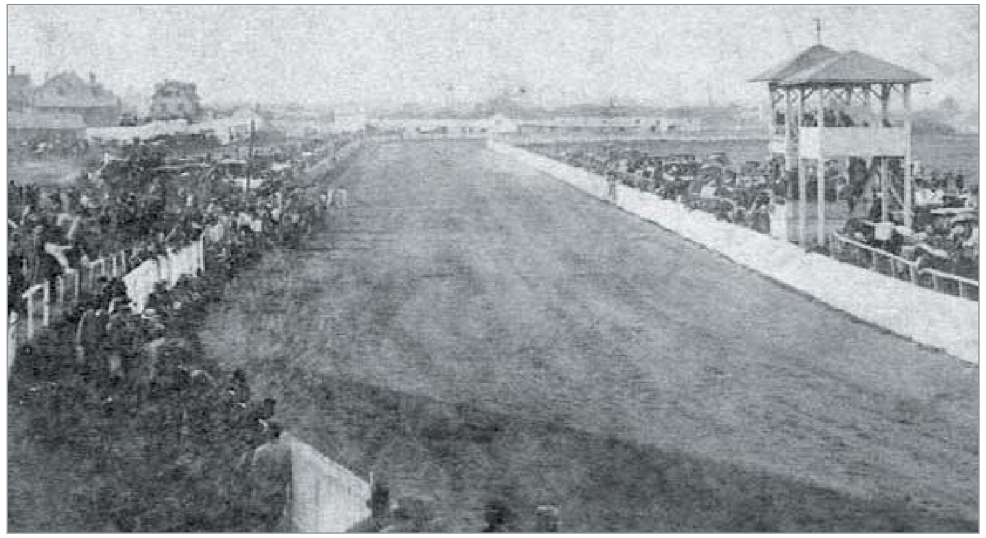
Existing land use within the Project Area consists of highway and street roadways, the PDW Path and railroad transportation elements surrounded by undeveloped open space, largely portions of the former rail yard. Figure 4.2-1 presents parcel and easement ownership within the Project Area.

Land uses along the eastern portion of the Project Area include riverfront parkland, (forest/shrub strips along the bank of the Charles River), and the PDW Path and SFR riverside parkways. Genzyme's Allston facility is located at the southwest corner of the intersection of Western Avenue and SFR. West of Genzyme Corporation and south of Western Avenue, land use consists of a previously developed area where the buildings have been demolished. South of Genzyme and north of Cambridge Street, land use includes the I-90 loop ramps with the ramp infield consisting of a paved parking area used for tractor trailer storage by Houghton Chemical. South of Cambridge Street and west of SFR, land use includes a hotel (DoubleTree Suites) and a chemical manufacturer and distributor (Houghton Chemical). Refer to Graphic 4.2-1 for the location of land uses described herein.

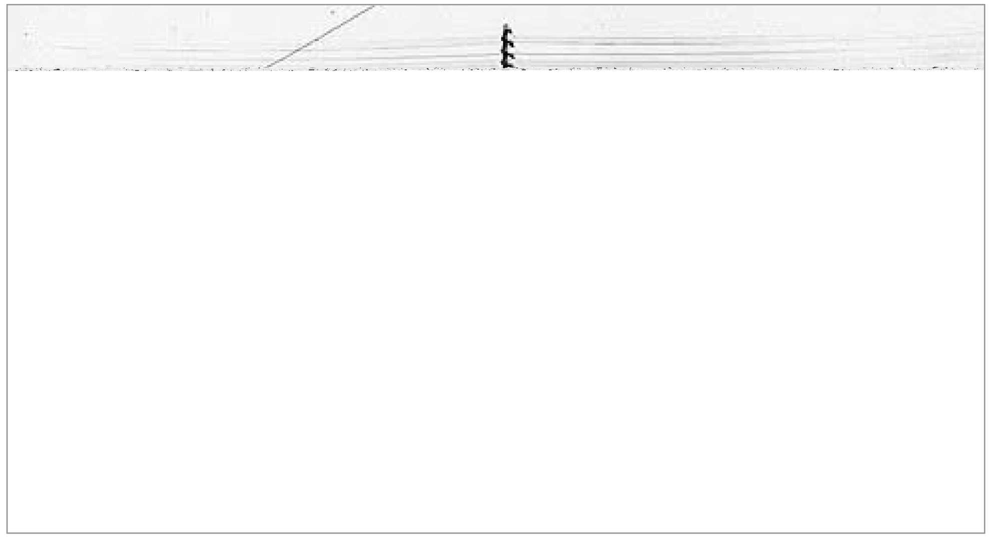
South of Cambridge Street and extending west within the Project Area, land use consists of the I-90 roadways and on- and off-ramps. Small areas of open space consisting of wooded areas and grassed infield areas extend to the west along the I-90 roadways in this portion of the Project Area. In addition, access drives to the rail yard extend under the I-90 roadways in this area. South of I-90, land use within the Project Area consists of the rail yard and the commuter rail tracks. Land use south of the commuter rail tracks and west of BU consists of single-, two- and three-family residential areas, as does the area in the vicinity of Sorrento, Seattle and Windom Streets, north of Cambridge Street. Several small commercial establishments are also located on the north side of Cambridge Street including a service station, a liquor store and an auto body shop.



Beacon Trotting Park 1890. Brighton Allston Historical Society photograph



Beacon Trotting Park 1890. Brighton Allston Historical Society photograph



Cambridge St houses with Windom St in the center. Circa 1900. B&A roundhouse construction in foreground. The four houses on either side of Windom St are now gone. Brighton Allston Historical Society photograph

Aerial image, circa 1925

Aerial image, circa 1941

CADILLAC-OLDS

Construction of the Mass. Pike Extension by the BU Bridge, 1965

Rail Yard

Construction of I-90 and the Allston Brighton toll interchange bisected BPY in the 1960s. Rail operations have continued within parcels to the north and south of the highway. Harvard University Beacon Yards, LLC reached an agreement to purchase the yard from CSXT in 2009. They have completed some of the land transfer called for under their 2009 agreement, and they continue to work on additional transfers as of the date of this document. CSXT has shifted the majority of its railyard operations to central Massachusetts.

BPY is located within the Allston Landing South Economic Development Area (EDA), according to Boston Planning and Development Agency (BPDA) Article 51, the Allston-Brighton Neighborhood District. BPDA Article 51 is one of the means of implementing the Allston-Brighton Neighborhood Plan. The stated purpose of the Allston Landing South EDA is to promote industrial and manufacturing uses and to preserve and maintain the existing industrial uses that are vital to the city, state and regional economy. Use of BPY as layover for train sets currently complies with the Allston Landing South EDA regulations controlling development and land use.

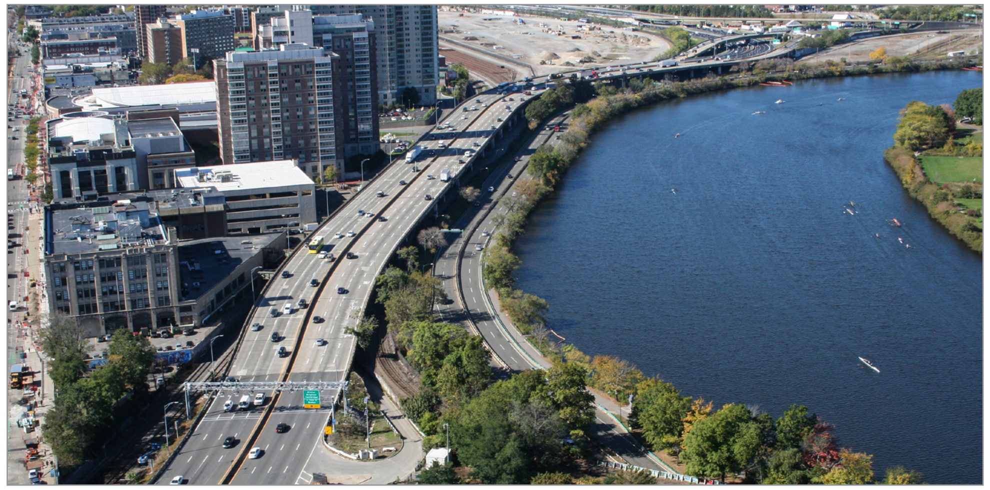
Worcester Main Line

Rail service has been operating along the Worcester Main Line in Allston since the mid-1800s, starting with the Boston and Worcester rail line in 1864. The segment of the Worcester Main Line that runs east west through the Project Area is shown on Figure 4.2-2. It consists of two tracks running along the southern side of BPY.

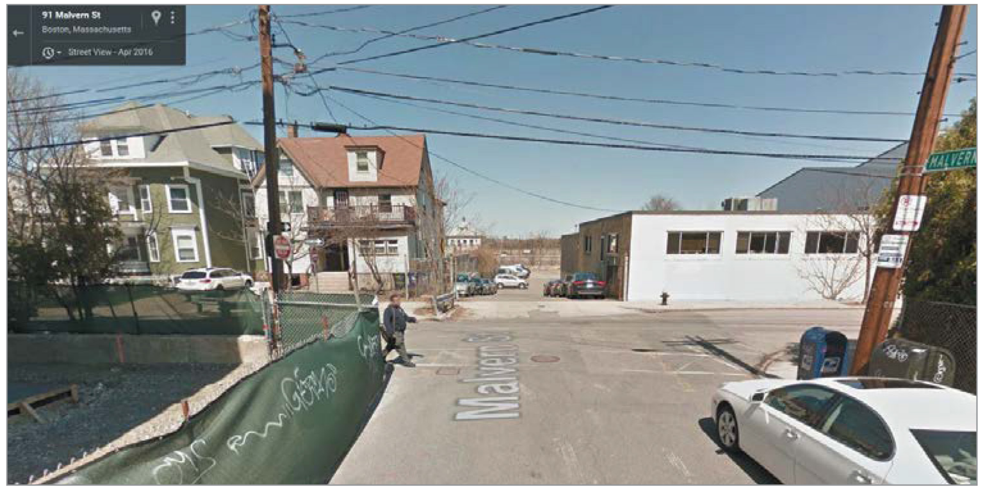
In the BU IMP, Sites A and B are designated for future support facilities related to athletics and/or administrative offices and for potential athletic/recreation facilities. The potential use for Site D is the continuation of its current athletic uses with the long-term potential of combining it with structured parking. The potential use for Site E, currently a parking lot, is structured parking. Sites F and G are designated for future use as mixed-use buildings with commercial/retail on the ground floor and upper floor residential, administrative and/or academic uses. BU has a strong interest in Parcel 1, an I-90 air rights parcel, and this site could also be affected by the Project Alternatives.

4.3 Visual Resources

Visual resources consist of the physical features that contribute to the aesthetic and visual character of the Project Area and the way it appears from surrounding areas. The following images illustrate existing conditions at certain location points that may be affected by the Project. These photographs highlight varying site conditions, providing an inventory with which to compare the Project Alternatives.



An aerial view of the Throat Area. It shows the adjacency of the Charles River to the PDW Path, (obscured by tree cover), which abuts SFR. SFR is next to the railway, which has the 8-lane I-90 viaduct overhead.



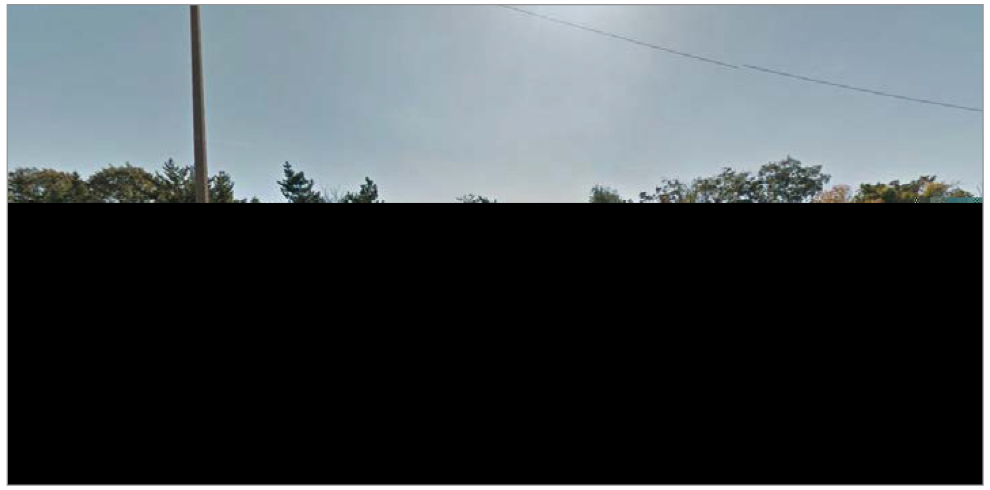
The southern edge of the Project Area facing north from Malvern Street. It shows multi-family residential housing and commercial buildings, and a view corridor to the rail yard.

232 Cambridge St
Boston, Massachusetts
Street View - Apr 2016
Cambridge St

A view from Cambridge Street looking southwest towards the western limit of the Project Area. To the north side of the street (right side of image), there are multilevel residential units, neighborhood convenience stores and a gas station.

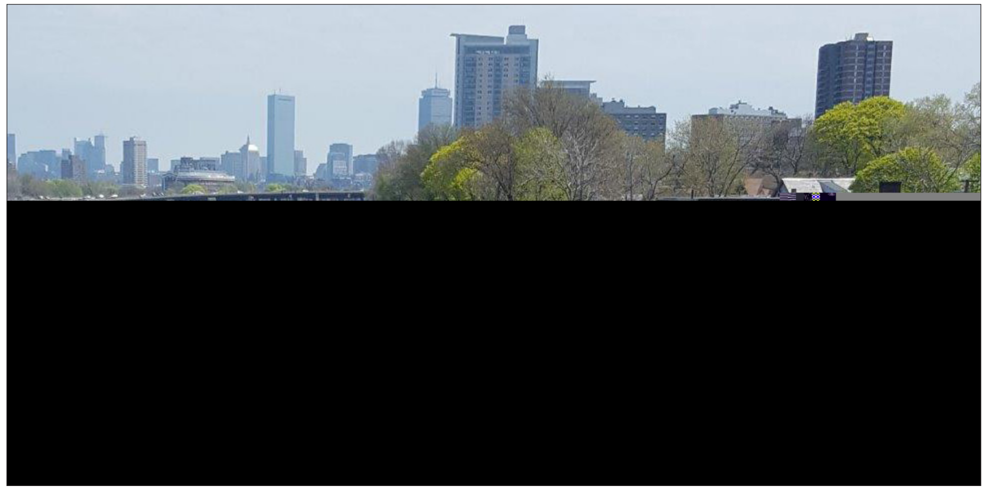
Soldiers Field Rd
Boston, Massachusetts
Street View - Apr 2016
Soldiers Field Rd

A ground-level view of SFR on the outbound side. The close proximity of the PDW Path is apparent, as is the presence of the viaduct.

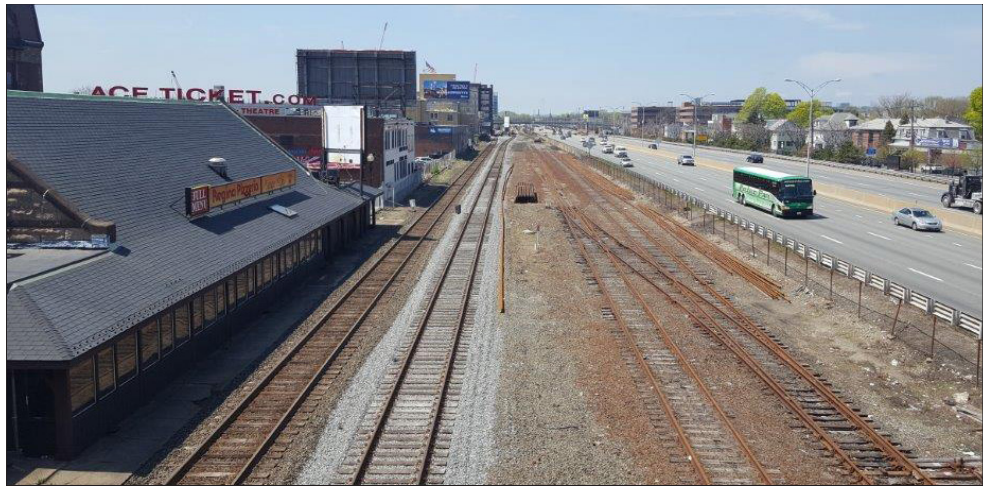


A view from Cambridge Street at the northern edge of the Project boundary, facing south into the Project Area. The view consists of the multiple lanes of Cambridge Street, with a median, and an open and unused tree-filled lot across the street.

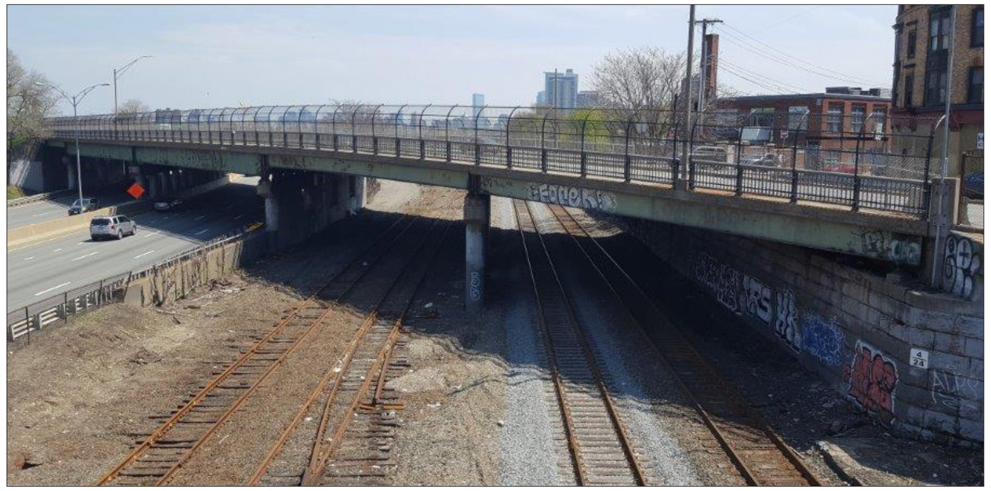
A view from the PDW Path, adjacent to the Cambridge Street exit from SFR. It demonstrates the close proximity of the roadway to the path. The narrowness of the path is apparent, bounded by a highway guard rail and decorative guardrail.



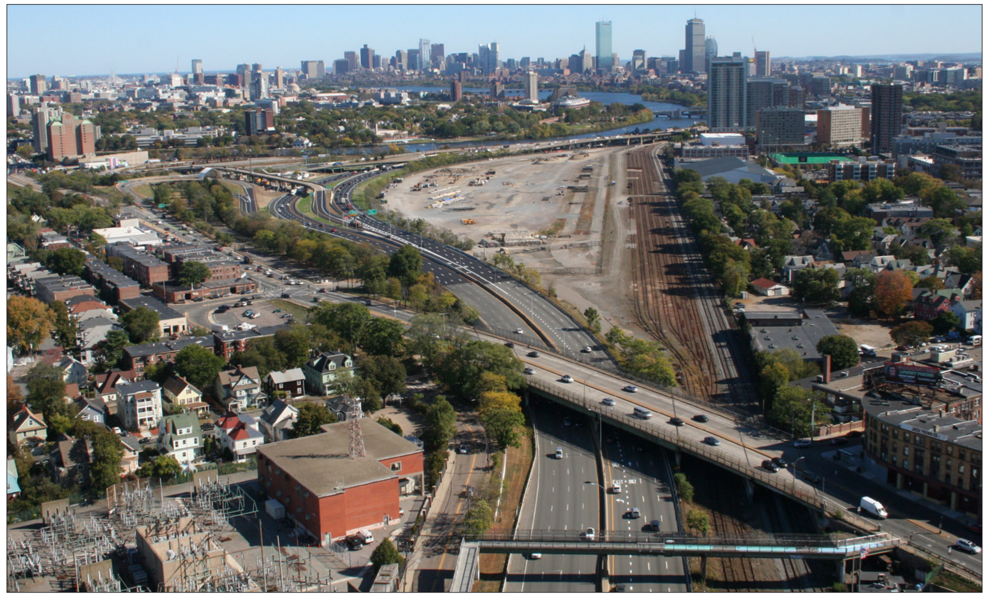
View looking east from the Cambridge Street Bridge (Worcester Main Line Tracks on far right)



View looking west from Franklin Street Pedestrian Bridge (Worcester Main Line Tracks and former B and A Depot Building, now Pizzeria Regina, on far left)



View of Cambridge Street looking east from Franklin Street Pedestrian Bridge (Worcester Main Line Tracks on far right)



Aerial view of BPY

Rail Yard

The rail yard has been operating in this location since the 1890s, and accordingly, the visual and aesthetic character of the yard is industrial. The yard visually consists of railroad tracks, ballast, concrete pads, pavement and small material stockpiles. There are no visual obstructions within the yard.

Views of the rail yard are heavily obscured from the south by residential homes and BU-owned buildings. Some limited ground-level views of the rail yard are available between buildings from surface streets that run parallel to the Worcester Main Line, including Pratt Street and Wadsworth Street. The buildings associated with BU are oriented away from the rail yard and do not provide views of the yard. Chain-link fencing is present between the rail ROW and the residential and institutional uses to the south, with periodic vegetation.

The north edge of the rail yard abuts I-90, and both the eastbound and westbound lanes of the highway provide generally unobstructed views of the yard. I-90 is slightly elevated on the west end of the yard, which improves the view further. Limited vegetative screening is present between the highway and the yard. It does little to screen views in late fall and winter. Sections of the I-90 westbound lanes are lower in elevation than the eastbound lanes and do not provide views of the yard. Some ramps in the I-90 interchange are significantly elevated and provide completely unobstructed views of the yard, including the eastbound Exit 18 ramp and the I-90 eastbound entrance ramp. The elevated highway visually obstructs the rail yard from other residential areas and surface roadways located north of I-90.

To the east of the yard, westbound vehicles on SFR and cyclists and pedestrians using the PDW Path have a limited view of the yard through the structures supporting the elevated I-90 viaduct. To the west of the yard, vehicles, cyclists and pedestrians have an unobstructed view of the yard from the Cambridge Street Bridge that passes over I-90, the Worcester Main Line ROW and the western edge of the yard.

Worcester Main Line

As shown in the photographs at left, the Worcester Main Line runs east-west through the Project Area. It is an active railroad corridor. The existing operational characteristics of the line are described in further detail in the Rail and Transit section. The railroad ROW exhibits visual and aesthetic characteristics consistent with active railroad lines throughout the region. The ROW consists of railroad tracks and ballast, with sections of fencing and vegetative screening. Sections of the Worcester Main Line are visible throughout the Project Area:

- **East of rail yard through the Throat Area:** The Worcester Main Line is visible from SFR and from the PDW Path through the I-90 viaduct support structures, from Buick Street where it runs parallel to the Worcester Main Line, and from the Commonwealth Avenue bridge over the Main Line and I-90.
- **South of rail yard through the center of the Project Area**: Sections of the Worcester Main Line are visible from Babcock Street, Ashford Street, Wadsworth Street and Pratt Street between structures, buildings, fencing and vegetative screening. The Main Line is visible from the north side of BPY from I-90 and some ramps associated with the highway.
- **West of rail yard under the Cambridge Street Bridge:** The Worcester Main Line is visible from the Cambridge Street Bridge, from I-90 and from the Franklin Street Pedestrian Bridge.

Graphic 4.4-1: Project Area Open Space

4.4 Open Space & Recreation

Open space and recreation focuses upon land areas open to the public for enjoyment of passive and active use of discretionary time, leisure, exercise and contemplation. The Project borders the Charles River Reservation to the east. The reservation is a significant open space and recreational resource under the care, custody and control of the DCR. The reservation is a linear park stretching from Boston Harbor and continuing along and including the Charles River for 20 miles. The lower half of the reservation, from downtown Boston to the Watertown Dam, is the Charles River Basin, which includes the Esplanade on the Boston side. The DCR's Charles River Reservation is both a Project Area neighborhood and a regional recreational resource. Graphic 4.4-1 illustrates the open space resources in the Project Area. The character of the basin changes upstream at the BU Bridge where the river narrows. The segment between the BU Bridge and the Watertown Dam is a zone of transition from urban and formal to rural and natural. Also within the reservation is the PDW Path.

Magazine Beach on the north side of the Charles River is a popular neighborhood and regional park with recreational fields, picnic and play areas, a DCR pool facility, a private boat club, and other amenities. It is easily accessible to the adjacent Cambridge neighborhood, and although it is within one-half mile of the Project Area, it is not easily accessed by the Allston/Brighton and Brookline neighborhoods due to difficult walking and bicycling connections.

The cities and neighborhoods of Allston/Brighton, Brookline and Cambridge are all within one-half mile of the Project Area. The *City of Boston Open Space and Recreation Plan 2015-2021* identifies the neighborhood as being low in the acreage of protected open space per 1,000 residents, compared to city averages. It also identifies the current I-90 corridor as a barrier to park access.

According to the Open Space Plan, about one-third of the greater Allston/Brighton open space is owned by the educational institutions (Harvard University and BU in the Project Area, and Boston College). This contributes a sense of spaciousness and visual amenity. The Open Space Plan identifies Allston as lacking in usable open space and anticipates the need increasing as the neighborhood develops.

Section 4(f) Parkland

DCR parkland within the Project Area qualifies as a public parkland protected under Section 4(f). On the Boston side of the Charles River Basin, the boundaries of the DCR parkland extend from the railroad ROW to the center of the river, including SFR, the PDW Path, and all greenspace in between, as shown on Figure 4.4-1. Within this parkland parcel are features characterized as traditional recreational parkland spaces such as the muti-use PDW Path, the Charles River and greenspace along the river. The DCR parcel also has existing uses that are not accessible for recreation and are characterized as buffer or landscaped space, including SFR and isolated greenspace areas. All areas are considered public parkland under the care custody and control of DCR; and therefore, all are considered Section 4(f) properties. The total acreage of the parkland parcel within the Project Area is approximately 11.7 acres (508,500 square feet). Graphic 4.4-2 presents the Section 4(f) parkland within the Project Area.

In 1972, Massachusetts voters approved Article 97 of the State Constitution, granting people the right to a clean environment and authorizing the Commonwealth to acquire conservation easements. Article 97 was intended to be a legislative check to ensure that lands acquired for conservation purposes were not converted to other inconsistent uses.

Article 97

The Charles River Reservation is subject to Article 97 of the 1972 Amendments to the Massachusetts Constitution that protect public parklands and open space land acquired for natural resource and historic preservation purposes. Any conversion of land protected for such purposes requires a two-thirds vote by both houses of the Massachusetts legislature. Article 97 mandates that any unavoidable impacts (and subsequent change in use) of any publicly-owned open space protected by Article 97 are minimized to the greatest extent possible and that adequate measures are proposed to mitigate the unavoidable impact. Article 97 requires an overall "no net loss." Mitigation would be required for any conversion of lands held under Article 97. Graphic 4.4-2 presents the Article 97 Land within the Project Area.

Cambridge St
CAMBRIDGE
BOSTON

Graphic 4.4-2: Article 97 Land

4.5 Socioeconomics

In this document, the socioeconomic analyses focuses on: (1) how the Project under study will affect economic development; and (2) what social and economic impacts the Project could potentially have on the people, neighborhoods, communities and the region surrounding it.

This section presents the existing social and economic conditions in the Local Affected Area prior to the start of construction. Information developed for the baseline condition forms the basis of required analyses of impacts and opportunities presented by alternative transportation improvements on local and regional economic development and institutional development plans within the Project Area and surrounding communities.

4.5.1 Local Affected Area

MassDOT has identified an area surrounding the Project Area where social and economic conditions are most likely to be directly affected by the Project, identified herein as the Local Affected Area. The Local Affected Area was drawn to include key institutional properties of Harvard University and BU, and important development projects such as Boston Landing and Barry's Corner. This area includes the neighborhoods whose residents and businesses are most affected by the existing interchange configuration and therefore will be most likely to be impacted by any changes in access and accessibility as a result of the Project. Graphic 4.5-1 shows the Local Affected Area.

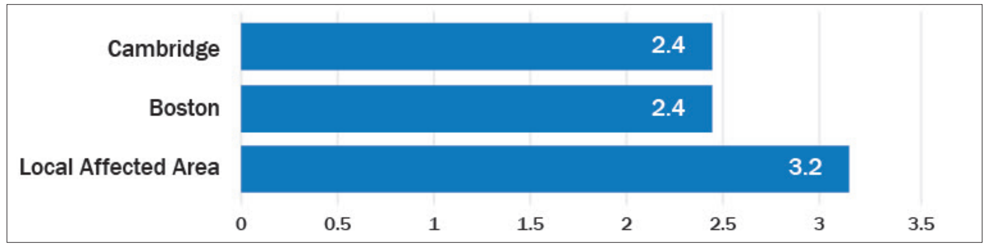
A proprietary subscription database was used to develop social, economic and business profiles of the Local Affected Area. Those profiles were then compared to the same data for the City of Boston and City of Cambridge. The following sections describe the results of the examination. The following graphs provide a summary of the detailed information in Tables 4.5.1 through 4.5.7 in Appendix D, Socioeconomic Data.

4.5.2 Local Affected Area Profile

Demographic Characteristics

The Local Affected Area has seen fast growth in the decade between the last two censuses. That growth has slowed since the 2010 census, but has still been robust. Household size is considerably higher in the potentially affected neighborhoods than in either Boston or Cambridge. The area's population is younger than that of Boston or Cambridge, and household incomes are lower.

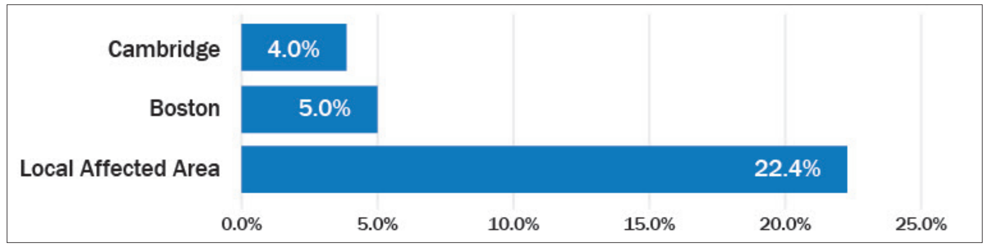
Average Household Size



Population

The graph below presents key demographic characteristics of the population and households in the Local Affected Area as well as the cities of Boston and Cambridge. Of particular note is the extremely rapid 22% rate of growth in the Local Affected Area between the 2000 and 2010 censuses. Between 2010 and 2016, however, the rate slowed considerably to an estimated 7.7%, less than Boston's 8.4% and higher than Cambridge's estimated growth rate of 6.1%. This recent trend is expected to slow even further over the next five years.

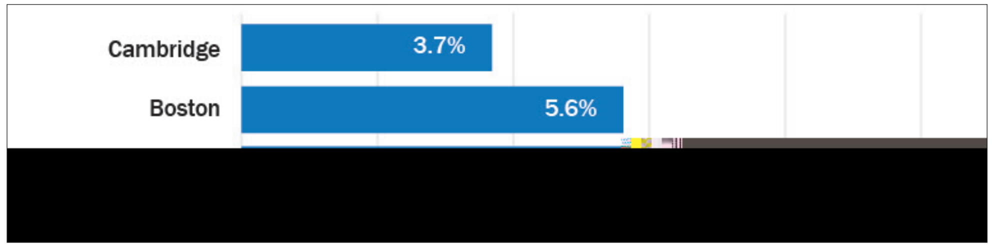
Population Growth Rate 2000-2010



Households

The rapid growth in population between 2000 and 2010 was not matched by a commensurate growth in the number of households, which increased by only 8.1%. This was still more than the growth in either Boston or Cambridge. The result was a 13% increase in the average size of households in the Local Affected Area between 2000 and 2010. Household sizes in Boston and Cambridge remained virtually the same over that period.

Household Growth Rate 2000-2010



Age Profile

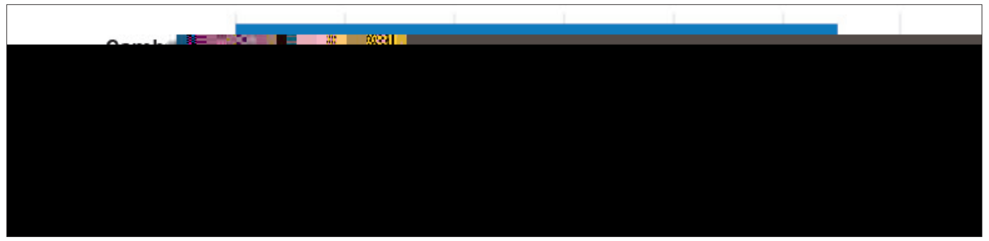
The age distribution also presents distinctive features: the largest age group in the Local Affected Area is the population aged 18-34, which at 62%, is considerably larger than that age group in Boston (37%) or Cambridge (45%), most likely reflecting the heavy concentration of students. Although the percentage of individuals under the age of 18 is considerably lower in the affected neighborhoods than in Boston as a whole, the estimated median age of the population (27 years) is six years younger than that in Boston and Cambridge, again most likely weighted by the student population. The potentially affected population aged over 65, on the other hand, is half the proportion in Boston and Cambridge.

Estimated Household Income

Incomes in the Local Affected Area are generally lower than those in Boston and Cambridge. Regarding estimated average, median, and per capita incomes, the Local Affected Area ranks lower compared to both Boston and Cambridge. As shown in Table 4.5.1 in Appendix D, Socioeconomic Data, the biggest gaps are between the Local

Affected Area and Cambridge. The distribution of low income households also bears mention: 30% of households in the Local Affected Area have incomes under $25,000, as do 28% of Boston households and 20% of Cambridge households.

Estimated Average Household Income 2016



[redacted]

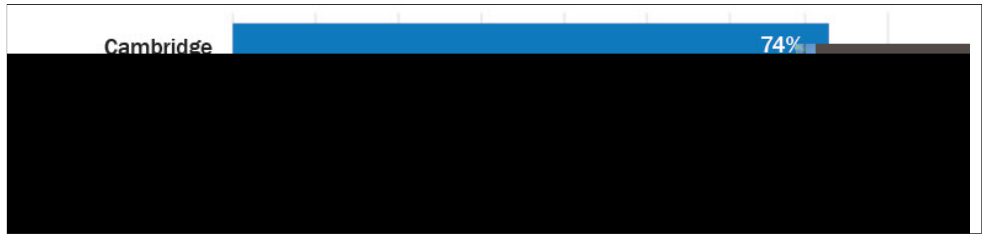
Education and Occupations

The population of Cambridge has the highest levels of education compared to those of Boston and the Local Affected Area. The lower labor force participation rate in the Local Affected Area most likely reflects its student population. Most workers are white collar in all areas compared, although a larger proportion of workers in the Local Affected Area are engaged in service occupations.

As shown in the following graph and Table 4.5.2 in Appendix D, Socioeconomic Data, 74% of Cambridge residents have a bachelor's degree or higher; this is followed by residents of the Local Affected Area at 55% and Boston at 45%.

The employment status of the three areas varies. Within the Local Affected Area, 58% of the working-age population is employed, compared to 63% in each of the cities. The Local Affected Area has a larger proportion of persons not in the labor force, again most likely reflecting its student population. Of those in the labor force, about two-thirds are white collar, in both the Local Affected Area and Boston, compared to 84% of the Cambridge labor force. A larger proportion are engaged in service occupations in the Local Affected Area than in the two cities.

Education: Percent with Bachelor's Degree or Higher

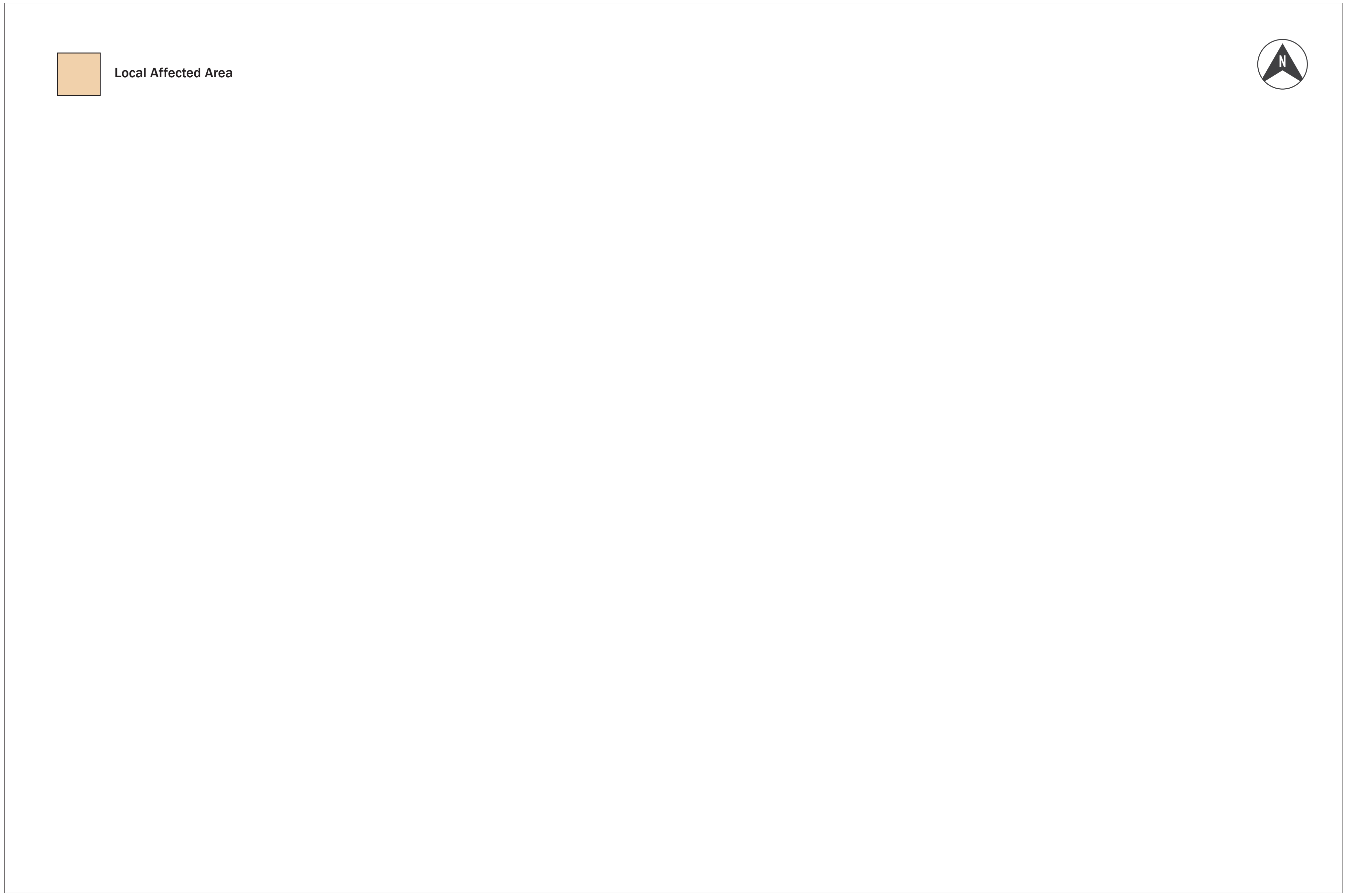


[redacted]

Transportation Characteristics

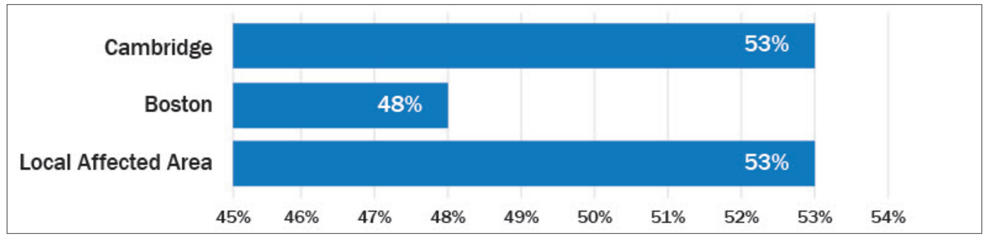
All three areas, Boston, Cambridge and the Local Affected Area, are characterized by heavy reliance on public transportation and walking to get to work -- over half of workers in the potentially affected neighborhoods and in Cambridge use these two modes.

Boston workers are slightly more likely to drive alone to work than the other two areas, and when carpoolers are included, a total of 45% of workers depend on a car to get to work. Cambridge is least reliant on driving to work and has the most workers who walk to their jobs. Apart from "other means," bicycling is the least-used mode of travel to work in the Project Area and Boston, but Cambridge bikers outnumber carpoolers. Vehicle ownership reflects the travel to work patterns -- all three areas average less than one vehicle per household. Over half of workers in all three areas get to work in less than 30 minutes. Table 4.5.3 in Appendix D, Socioeconomic Data, displays these results.

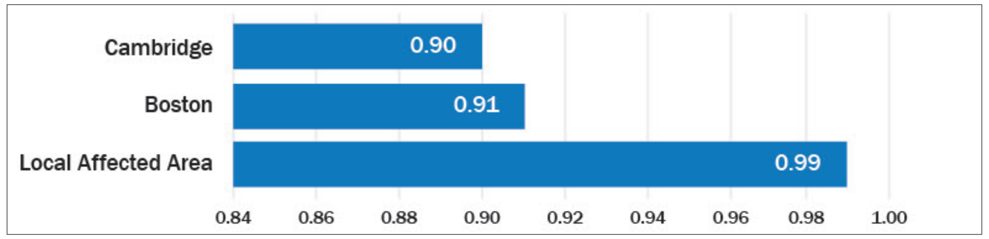


Graphic 4.5-1: Local Affected Area

Use Public Transportation or Walk to Work



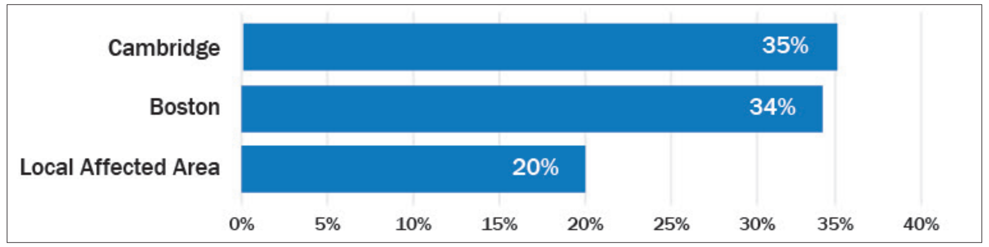
Estimated Number of Vehicles (per household)



Housing Characteristics

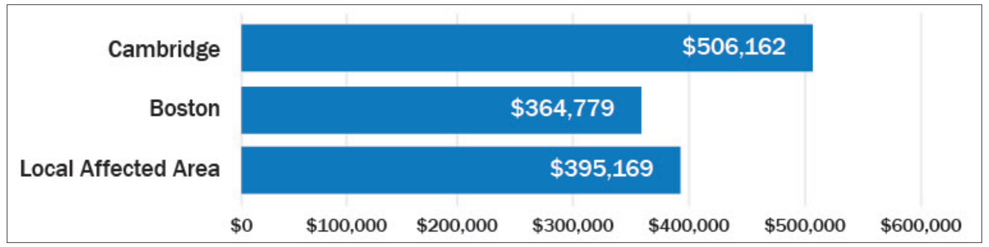
Although the Local Affected Area neighborhoods have the lowest incidence of homeownership, 20%, of the three areas examined, homeowners there have the longest average length of residence – over 20 years. Owner-occupied home values are higher in Cambridge than in Boston or the Local Affected Area. The predominant structure type is multi-family. Table 4.5.4 in Appendix D, Socioeconomic Data, displays these figures, as well as average values and structure types.

Percent of Owner Occupied Units



Home values in the Local Affected Area are slightly higher than those in Boston, but considerably lower than those in Cambridge. The Boston Globe of September 17, 2016 carries an article on the “white hot” housing market in Boston, citing as an indicator a group of multi-family structures in Allston that just sold for $520,000 per unit. The developer has developed several properties in Allston (See Appendix D, Socioeconomic Data.) Multi-family structures predominate in all three areas, and their distribution by number of units is similar across all three.

Median Values of Owner Occupied Housing



Business and Employment Profile

The Information sector is the largest employer in the Local Affected Area. For Boston, Healthcare and Social Assistance is the top employer, and for Cambridge, the largest employment sector is Professional, Scientific and Technical Services.

Table 4.5.5 in Appendix D, Socioeconomic Data, shows the business types in the three areas, organized by North American Industry Classification System (NAICS) codes. For each area, highlighted cells show the largest employers. For the Local Affected Area, Information (21%), Retail Trade (14%), Healthcare and Social Assistance (9%), and Accommodation and Food Service (10%) are the top employers. Looking more closely at Retail Trade, the largest single employer is Food and Beverage, generating almost half of the annual retail sales. If the sectors are ranked by annual sales, Information, Retail Trade, Wholesale Trade and Manufacturing emerge as major contributors to the economy.

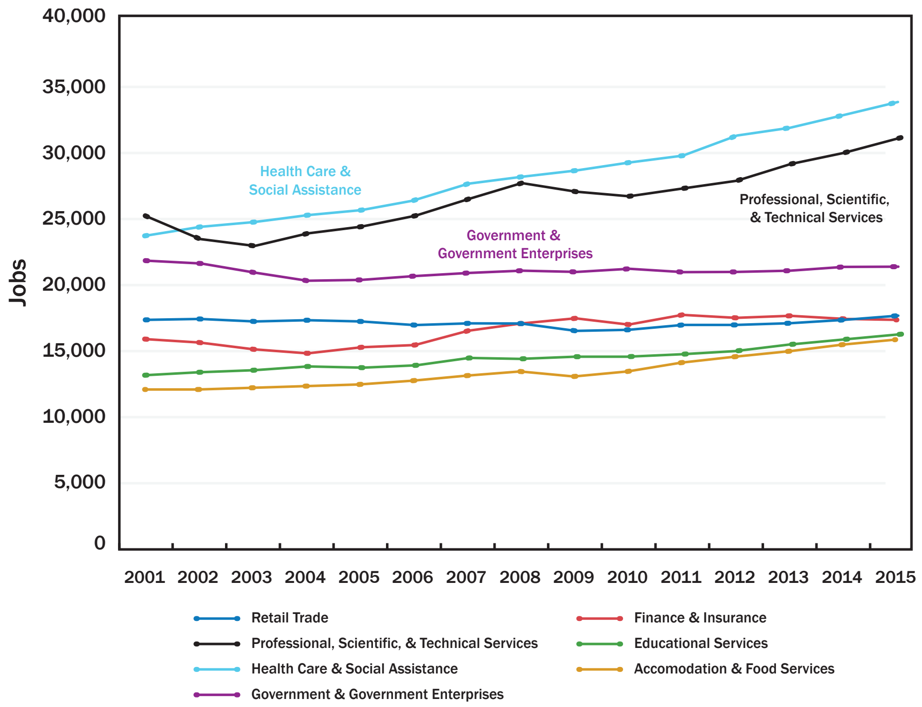
For Boston, the top employers are Healthcare and Social Assistance (21%); Professional, Scientific and Technical Services (14%); and Finance and Insurance (12%). Wholesale Trade, closely followed by Healthcare and Social Assistance and Finance and Insurance, rank high in annual sales.

Cambridge’s top employment sector is Professional, Scientific and Technical Services. This sector employs 17% of the city’s workforce, making it a dominant force in the economy. Other sectors are distant seconds, with Educational Services and Healthcare and Social Assistance at 11% and Accommodation and Food Services at 10%. Healthcare and Social Assistance is common to all three areas as a significant source of employment. Manufacturing is the largest generator of annual sales in Cambridge, compared to fourth largest in the Local Affected Area and eleventh largest in Boston.

Regional Context

The conditions in the Local Affected Area should also be understood within their regional context. The I-90 Allston Interchange serves the economy of a much larger area, which is defined here as the three-county region of Norfolk, Suffolk and Middlesex. This area was selected because it contains between 83% and 100% of all trip ends served by the interchange. The region encompasses almost 2.5 million jobs, which have grown by 12% over the period 2001 to 2015. Table 4.5.6 in Appendix D, Socioeconomic Data, shows employment data for Norfolk, Suffolk and Middlesex Counties, combined as a region. The blue highlights show the industry sectors employing the largest numbers of workers, with Healthcare and Social Assistance and Professional, Scientific and Technical Services being the clear leaders in numbers of jobs.

Graphic 4.5-2 shows the historical change in employment for the seven largest employment sectors. (See Table 4.5.6. in Appendix D, Socioeconomic Data). It also shows the percentage changes in these sectors between 2001 and 2015: total employment in the three-county region increased by 264,000 jobs, a 12% gain. The greatest growth occurred in the Health Care and Social Assistance sector (42% gain between 2001 and 2015), followed by Accommodation and Food Services (31%), Professional, Scientific and Technical Services (24%) and Educational Services (24%). Employment in Finance and Insurance grew less than the region overall (9%) as did Retail Trade (2%). Government employment decreased by 2% between 2001 and 2015.



Graphic 4.5-2: Historical trends in largest regional employment sectors

Planned and Proposed Development

A review of planning documents relevant to development in the Local Affected Area was undertaken during the preparation of the Draft Environmental Impact Report (DEIR). The following is a list of those reviewed. The documents themselves are summarized in the Socioeconomic Appendix D, Socioeconomic Data.

Placemaking Report, I-90 Allston Interchange Improvement Project, Boston Planning and Redevelopment Agency, October 2016

Harvard University Institutional Master Plan for Harvard University’s Campus in Allston, July 2013, revised October 2013

Economic and Fiscal Impact of the Proposed Boston Landing Development in Brighton, Massachusetts, July 18, 2013, by RKG Associates for NB Development Group, LLC

Boston University Charles River Campus 2013-2023 Institutional Master Plan, January 17, 2013, by Fort Point Associates for Trustees of Boston University

Brighton Guest Street Area Planning Study & Urban Design Guidelines, for the Boston Redevelopment Authority by Sasaki & Associates, Inc., April 12, 2012.

North Allston Strategic Framework for Planning, Boston Redevelopment Authority, 2005

North Allston-Brighton Community-Wide Plan (CWP), Boston Redevelopment Authority, 2008-2009

Because the Project is likely to have impacts on economic development in the area, an inventory of planned and proposed projects was compiled from the BPDA’s Article 80 Process where development projects are reviewed by the city. The inventory, provided in Appendix D, Socioeconomic Data, summarizes those projects and their relevant characteristics.

4.6 Historic and Archaeological Resources

This section describes the existing historic and archeological resources associated with the Project.

The Project must comply with laws that require state and federal agencies to take into account the effects of their undertakings on historic properties. These laws include specific historic preservation legislation such as Massachusetts G.L. Chapter 9, Sections 26-27C, as amended by Chapter 254 of the Acts of 1988 (950 CMR 71.00), and Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800). Other more general environmental laws, such as the Massachusetts Environmental Policy Act (MEPA), the National Environmental Policy Act (NEPA), and Section 4(f) of the U.S. Department of Transportation Act of 1966, also have historic preservation components.

One of the first steps in complying with each of these state and federal laws is to identify historic and archaeological properties within the Project's Area of Potential Effect (APE). An APE is defined as "…the geographic area within which the undertaking may cause changes in the character of or use of historic properties, if any such properties exist" [36 CFR 800.16 (d)]. MassDOT's Cultural Resources Unit (CRU) staff has established an APE for the Project and undertaken surveys within the APE to identify historic properties. Figure 4.6-1 shows the APE and historic resources in the Project Area; Graphic 4.6-1 shows the historic resources photo locations. A historic property is defined as "…any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior" [36 CFR 800.16(1)]. MassDOT's CRU staff also has identified properties, areas and sites that are included in the Inventory of Historic and Archaeological Assets of the Commonwealth maintained by the Massachusetts Historical Commission (MHC) and has evaluated those properties to determine if they are eligible for listing in the National Register (NR). Following is a description of these properties.

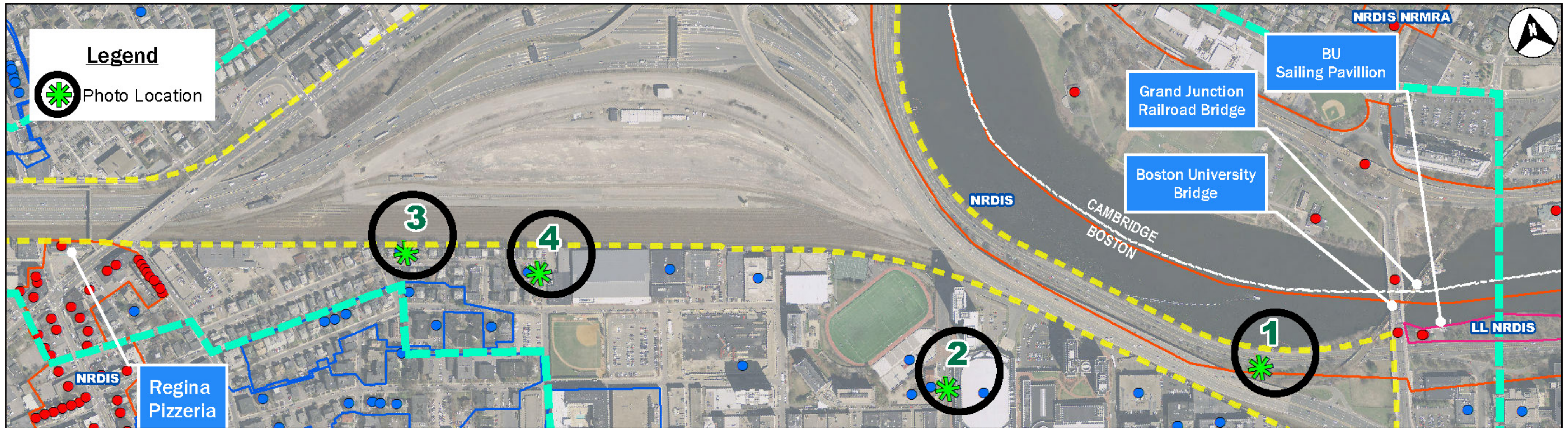
4.6.1 Charles River Basin

The Charles River Basin Historic District (BOS.CA), located at the eastern edge of the Project Area, is listed in the State and National Registers of Historic Places (NRHP). The historic district is comprised of the easterly portion of the Charles River Reservation, a state park under the care, custody and control of the DCR. DCR parkand in the Project Area is shown in Figure 4.6-2. The Charles River Basin is the keystone element in the Metropolitan Park System of Greater Boston, the first such regional park system in the United States. Historically a tidal estuary flanked by mud flats, the lower reaches of the Charles River were transformed into a park-lined basin after construction of the Charles River Dam in 1910. The 820-acre historic district extends along both banks of the Charles River in Boston and Cambridge and includes the Charles River Basin itself, the bridges across the Charles River, and the parkways and landscaped areas on both banks of the river for approximately six miles, from the Charles River Dam to the Eliot Bridge.

The contributing elements of the Charles River Basin Historic District within the APE include the following:

Storrow Drive and SFR

Storrow Drive and SFR are the parkways that extend along the Boston side of the Charles River Basin. Storrow Drive transitions to SFR at the BU Bridge. Both roads generally carry two lanes of traffic in each direction, separated by a narrow barrier, with under- and over-passes in several locations.



Graphic 4.6-1: Historic resources photo locations

Looking west on SFR (1)

Although a parkway along the Boston side of the Charles River had been envisioned as early as 1851, it wasn't until 1949 that construction of Storrow Drive was authorized. A portion of SFR west of the Project Area has even earlier roots as part of the Speedway, which had been built about 1895 for carriages and sleighs before ceasing operations in the 1950s.

Within the Project Area, plans for the portion of SFR between North Harvard Street and Western Avenue date to 1910, while plans for the segment between Cambridge Street and the BU Bridge date to 1930. Alterations to both sections of the roadway were subsequently undertaken in the 1950s and 1960s. The Cambridge Street Underpass (B-16-377) and Western Avenue Underpass (B-16-375) are both concrete T-beam structures constructed in 1954. The northerly side of SFR is adjacent to parkland along the Charles River embankment, which includes narrow lawn areas and the Dr. Paul Dudley White Bike Path (PDW Path). The southerly side of SFR is adjacent to a narrow grass strip situated between the paved roadway and the fence along the railroad ROW. This narrow grass strip marks the southerly boundary of the Charles River Reservation but is generally inaccessible to the public. The elevated I-90 viaduct, which extends along the railroad ROW above the railroad tracks, borders SFR for approximately one-half mile west of the BU Bridge just outside of the southerly boundary of the Charles River Reservation.

Trees were planted along both sides of SFR sometime after 1938, but many have been removed in the intervening years. Today volunteer trees have grown up from the river embankment on the north side of the SFR. An intermittent line of trees survive in the narrow grass strip along the southerly side of the SFR, but the trees are generally in poor health.

In response to the Project ENF, conflicting statements were submitted related to SFR's status as a contributing property within NR-listed Charles River Basin Historic District. (See the State Historic Preservation Officer's letter dated December 12, 2014 and the DCR Commissioner's letter dated December 15, 2014 in Chapter 9.) It is MassDOT's opinion that the portion of SFR within the Project Area was intended to be a contributing element within the Charles River Basin Historic District (BOS.CA). The nomination form for the district states that "the Charles River Basin National Register District incorporates the Charles River Basin and the parkways and landscaped areas on both banks for approximately six miles upstream from the Charles River Dam to the Eliot Bridge…it includes…the James J. Storrow Memorial Drive and Soldiers' Field Road in Boston…" The portion of SFR within the bounds of the Project Area is, however, outside the bounds of the Charles River Parkways District (BOS.YK), whose eastern boundary at the Elliot Bridge is outside the Project's APE.

Boston University Bridge

Carrying Brookline Street over the Charles River and SFR between Boston and Cambridge, at the southeastern edge of the Project Area, the BU Bridge (Bridge #B-16-007) was constructed in 1927-1928 and is comprised of a steel through arch central span with flanking concrete arch spans. The bridge is a landmark structure and a major contributing element with the Charles River Basin Historic District. The bridge was completely rehabilitated in 2012 as part of the MassDOT Accelerated Bridge Program.

Grand Junction Railroad Bridge

The steel plate girder railroad bridge, constructed in 1927-1928, carries the GJR Line over the Charles River and under the BU Bridge. A separate steel plate girder bridge (Bridge #B-16-065), constructed in the same period, carries the GJR over SFR.

River Street Bridge

Constructed in 1926, this three-arch reinforced concrete bridge (Bridge #B-16-006) carries River Street over the Charles River and lies at the northeastern edge of the Project Area.

Western Avenue Bridge

A three-arched, cast-in-place reinforced concrete structure, the Western Avenue Bridge (Bridge #B-16-010) was constructed over the Charles River in 1924. It is located north of the River Street Bridge, outside the direct Project Area but within the APE.

Charles River Esplanade

The Charles River Esplanade (BOS.ZI) is the parkland between the Charles River and the northerly boundary of Storrow Drive, between the BU Bridge and the Charles River Dam. A small area of the western end of the Esplanade extends into the eastern boundary of the APE.

Boston University Sailing Pavilion

Located immediately east of the BU Bridge, this single-story sailing pavilion was constructed in 1935 to provide facilities for BU's sailing program.

4.6.1.1 Cambridge Street/Harvard Avenue

The NR-listed Harvard Avenue Historic District (BOS.KN) encompasses approximately 23 acres of land along the north/south axis of the Harvard Avenue Corridor in Allston. This district is a significant illustration of small-scale land development by individual property owners and local real estate syndicates in the early 20th century. It is adjacent to the southwestern end of the Project at I-90.

The Allston Station, a Richardsonian Romanesque railway station constructed in 1887 by Shepley, Rutan & Coolidge, is located adjacent to the Project Area and within the bounds of the Harvard Avenue Historic District. The station has also been designated a Local Landmark by the City of Boston.

Other contributing properties to the Harvard Avenue Historic District within the APE include the Allen Building at 334-354 Cambridge Street (BOS.8111), the Wilson Block at 4-8 Harvard Ave. (BOS.8748), Allston Hall Block/Chester Building at 10-14 Franklin Street (BOS.8154), the Longfellow Building at 4-8 Franklin St. (BOS.8746), the W.R. Chester Block at 373-391 Cambridge Street (BOS.8113), the former gas station at 372 Cambridge Street (BOS.13212), and the building at 382-386 Cambridge Street (BOS.8744).

The building at 20-30 Franklin Street has not been inventoried and is adjacent to, but outside, the bounds of the Harvard Avenue Historic District. It appears the two-story, wood-frame commercial building dates to the 1880s based on historic photos from the time; however, it has been significantly altered by the replacement of its original wood-sided facade with a brick façade. The original fenestration of the façade has also been thoroughly altered. The building may be demolished as part of the Project, and so an inventory form has been prepared and included in Appendix E, Massachusetts Historic Inventory Forms. It is MassDOT's opinion that the building at 20-30 Franklin Street does not meet the criteria for individual NR-listing based on a loss of integrity, and it was excluded from the bounds of the immediately adjacent Harvard Avenue Historic District.

West of the Harvard Avenue Historic District, the inventoried Hano Street Area (BOS.KM) encompasses the full length of Hano Street. Developed during the early 1890s, this street of attached two-story, multi-family houses extends from Braintree Street south to the bend in Hano Street. All of the houses have been denatured by the application of artificial siding and loss of original doors and windows. Based on a loss of integrity, it is MassDOT's opinion that Area KM does not meet the criteria for NR-listing.

Located just outside the boundaries of the Harvard Avenue Historic District is an inventoried double Queen Anne house with Italianate details at 20-22 Highgate Street (BOS.8232). Constructed 1875-1885, the house has been denatured through the application of artificial siding, the replacement of ornamental details at the front porch, and the insensitive replacement of doors and windows. It does not appear to meet the criteria for NR-listing.

4.6.1.2 Boston University/Commonwealth Avenue

The BU/Commonwealth Avenue area within the APE includes an NR-listed building, an NR-eligible building, and an NR-eligible historic district. This area is located south of I-90 and the proposed West Station.

The Peter Fuller Building at 808 Commonwealth Avenue in Brookline (BKL.1755), a Classical Revival style building designed by architect Albert Kahn and constructed in 1927, is individually listed in the NRHP as part of the Brookline Multiple Resource Area. The Peter Fuller Building is also located within the inventoried Commonwealth Avenue Area (BKL.AO), however, the area has been subject to insensitive alterations and does not appear to meet the criteria for listing in the National Register.

Nickerson Field Entrance/Boston Braves Baseball Field Office and Gatehouse, 10-20 Gaffney St. (BOS.8184) (2)

The Nickerson Field Entrance/Boston Braves Baseball Field Office and Gatehouse (BOS.8184) at 10-20 Gaffney St. on the BU Campus appears to meet the criteria for NR-listing. The stucco, 2.5-story Mission-style building was constructed in 1915 with a red tile roof and a ground-floor arcade of 11 equal openings. The relatively well-preserved Field Office was part of a ballfield complex that was formerly home to the Boston Braves and is the birthplace of the New England Patriots. The associated Braves Field at 32 Agganis Way (BOS.15414) includes the fields and structures associated with the Nickerson Field Entrance, however, the original stadium structures have been replaced with high-rise dormitories and the field has been fully reworked. It is MassDOT's opinion, therefore, that the larger complex does not meet the criteria for NR-listing.

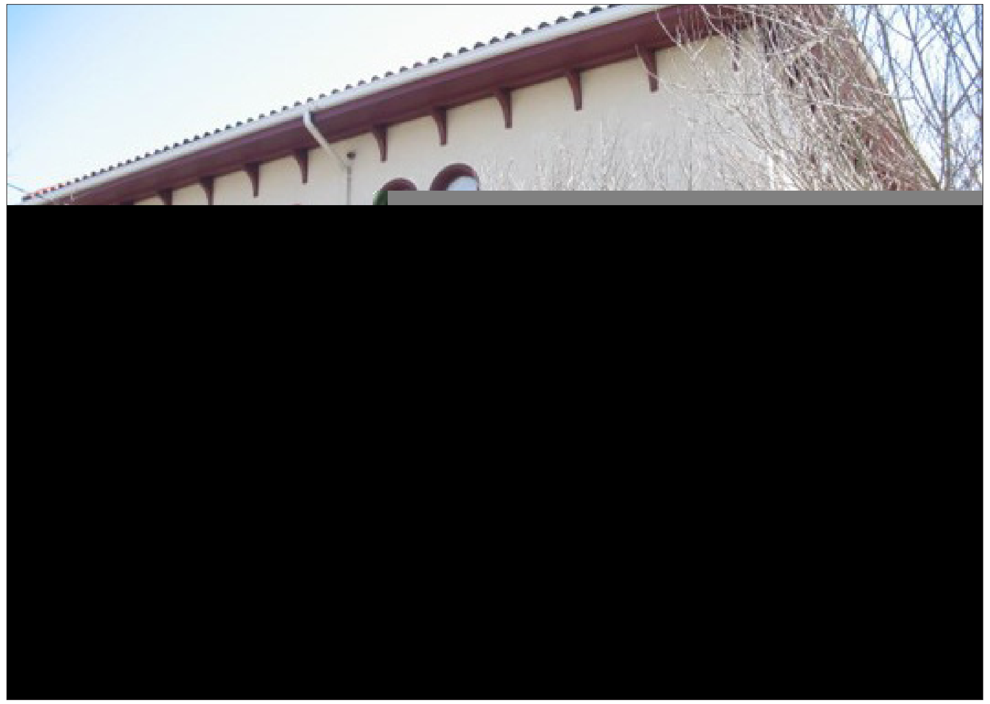
Packard's Corner (BOS.KO) is an irregularly-shaped area at the junction of Commonwealth and Brighton Avenues. The area appears to be NR-eligible as a historic district based on its associations with the automobile industry during the early 20th century and because of its concentration of architecturally interesting apartment buildings from the same time period.

Other buildings included in the Inventory of Historic and Archaeological Assets of the Commonwealth are in this area, but not listed in the State or National Registers of Historic Places. These include: the College of Fine Arts Building at 855-861 Commonwealth Avenue (BOS.8069); the BU College of General Studies at 871 Commonwealth Avenue (BOS.15420); New England Velie Auto Company Building/BU Office of Housing at 983-985 Commonwealth Avenue (BOS.15417); the BU Comptroller-Registrar's Office at 991 Commonwealth Avenue (BOS.15419); Ford Auto Showroom and Service Station/Boston University – West Campus – Rich Hall at 1019-1023 Commonwealth Ave. (BOS.15416); the Physical Plant Building at 120 Ashford Street (BOS.15429); the Clafflin, Sleeper and Rick Halls at 275 Babcock Street (BOS.9550); Athletics Department Building at 300-316 Babcock Street (BOS.15428); the Holland System Motor Company Building/Boston Playwright's Theater at 949 Commonwealth Avenue (BOS.15418); the Boston Academic Office Building at 25 Buick Street (BOS.15426) and the Shell Oil Company Building/BU Academy at 785 Commonwealth Ave. (BOS.15421). The Boston Buick Company Garage at 278 Babcock Street (BOS.15427) and the Commonwealth Armory (BOS.8068) formerly stood in this area but both have been demolished. Many of the extant buildings have been altered beyond recognition. None appear to meet the criteria for individual NR-listing, and the degree of alteration and new construction prevents any cohesive NR-eligible historic district from being formed.

The building located at 76 Ashford Street has not been inventoried but the property may be acquired to accommodate the proposed pedestrian bridge at Malvern Street. An inventory form has therefore been prepared and is included in Appendix E, Massachusetts Historic Inventory Forms. Constructed in the late 1950s/early 1960s, this single-story concrete block industrial building is home to Consolidated Sterilizer Systems. Based on an absence of architectural distinction, it does not appear that the building at 76 Ashford Street meets the criteria for NR-listing.

4.6.1.3 Wadsworth/Ashford/Pratt/Gardner Streets

This area south of the Worcester Main Line includes two individually inventoried buildings and two inventoried areas. None of the properties are listed in, nor appear eligible for, NR-listing.



[redacted]

Longfellow House, 4 Wadsworth St. (BOS.8321) (4)

The H.I. Sanford House at 9 Sawyer Terrace (BOS.8306) is located west of a proposed pedestrian bridge to West Station/BPY and the area south of the Worcester Main Line. Constructed in 1914 in the Craftsman-style, the two-by-two bay, pink stucco house has wide projecting eaves, paired round-headed windows, a terracotta roof, and a glassed-in entrance porch supported by cobblestone piers. An open lot is located between the house and the proposed bridge. While the house is unusual for the area, it does not appear to possess sufficient architectural distinction to meet the criteria for individual NR-listing, nor will it contribute to a potential historic district.

H.I. Sanford House at 9 Sawyer Terrace (BOS.8306) (3)

The Longfellow House at 4 Wadsworth Street (BOS.8321) is located immediately south of the Worcester Main Line. Constructed in 1890-99, the house is an irregularly-massed Queen Anne-style building with six gables and dormers. Much of the original detailing has been lost, however, with the application of artificial siding. It does not appear to retain sufficient integrity to meet the criteria for individual NR-listing.

The 5-69 Ashford Street Area (BOS.KS) is a residential area comprised of one and two family houses, three-deckers, and apartment buildings constructed for middle-class streetcar commuters between the 1860s to the present. Architectural styles represented include Italianate, Mansard, Queen Anne and Colonial Revival. While several houses retain some degree of architectural detailing, there has been a widespread application of artificial siding and the replacement of original doors and windows. Based on a loss of integrity, it does not appear that the area meets the criteria for NR-listing.

The 4-98 Gardner Street Area (BOS.LC) is located south of the Ashford Street Area and is similar in description: a residential area developed from 1855 to present, featuring a variety of single and two family homes, three-deckers and apartment buildings. A similar pattern of insensitive alterations, including artificial siding and replacement doors and windows, can also be seen. The Gardner Street Area, however, has a greater density of apartment buildings of incompatible style and scale. Based on intrusive construction, and a loss of integrity, it does not appear that the Gardner Street Area is eligible for NR-listing.

4.6.1.4 North of I-90 and Cambridge Street

North of I-90, at the western end of the Project Area, three inventoried areas overlap at the edge of the APE: Saint Anthony's Area (BOS.JM), the 51-168 Franklin Street Area (BOS.LB), and the 1-87 Adamson Street Area (BOS.KP). Saint Anthony's Area encompasses approximately 40 acres of mostly residential land and overlaps numerous smaller inventoried areas. Largely developed between 1840 to 1930, the area contains a variety of architectural styles and a mix of wood frame and brick buildings. The most prominent buildings include those associated with the c. 1894 St. Anthony's Roman Catholic Church. Within the APE, the inventoried properties have been altered through the widespread use of artificial siding and replacement windows and doors. While portions of Saint Anthony's Area might meet the criteria for NR-listing, those areas within the project APE do not appear to possess sufficient integrity and cohesion to be NR-eligible.

4.6.1.5 Beacon Park Yard & Interstate 90

In the portion of the Project Area where the majority of direct impacts will occur, BPY and the I-90 corridor, no NR-listed or NR-eligible properties are present. BPY has essentially been stripped of all standing structures with only a few small sheds of no historical interest surviving. The portion of I-90 within the Project Area contains the 1964-1965 viaduct structure and its associated ramps, along with the Cambridge Street, Franklin Street Pedestrian, and Everett Street bridges over I-90. These elements of the interstate are subject to the "Exemption Regarding Historic Preservation Review Process for Effects to the Interstate Highway System" published in the Federal Register on March 10, 2005 in Volume 70, Number 46. The exemption "releases all Federal agencies from the Section 106 requirement of having to take into account the effects of their undertakings on the Interstate Highway System, except for a limited number of individual elements associated with the system." None of the interstate elements within the Project Area have been identified as being excluded from the exemption.

4.6.2 Archaeological Resources

The categories of information reviewed to assess archaeological sensitivity of the Project's direct APE include the MHC site files, prior surveys of the general area, and documentary and cartographic sources. A review of the MHC site files did not identify any recorded archaeological sites within the APE. The closest recorded pre-Contact archaeological site (19-MD-172) is located east of the APE on the opposite bank of the Charles River at Magazine Beach Park. The closest recorded historic site (Cambridge Almshouse, CAM.1) is located east of the APE on the opposite bank of the Charles River at Riverside Press Park. The next closest recorded pre-Contact archaeological site (19-MD-173) is located approximately 1 mile north of the APE. The next closest recorded historic site (John F. Kennedy Birthplace, BKL.4) is located more than a ½ mile south of the APE.

Several archaeological reconnaissance surveys have been conducted within and in the vicinity of the APE. In 1978, a reconnaissance survey conducted in Riverside Park recommended that the park landscaping avoid the foundations of the former Cambridge Almshouse. In 2002, a reconnaissance survey was conducted in advance of the Cottage Farm Combined Sewer Overflow Storage Project at Magazine Beach Park. Based on extensive disturbance, the area was considered to have low potential for intact archaeological resources and no further surveys were recommended. In 2008, a Phase 2 reconnaissance survey was conducted as part of the Circumferential Transportation Improvements Urban Ring Corridor Project. The 2008 survey includes the APE of the current Project. The survey concluded that the existing city streets, highways, and abandoned and/or active railroad corridors in the area are extensively disturbed and retain no archaeological sensitivity.

A review of historic maps and aerial photographs indicates the APE has been heavily impacted by past filling and development activities. The APE historically consisted of a salt marsh that was filled during the mid-19th century. By 1864, Beacon Park, a trotting park for sulky racing, was constructed along the west bank of the Charles River between Cambridge Street to the north and the Boston and Albany Railroad tracks to the south. Beacon Park was sold to the Boston and Albany Railroad in the 1890s and the area was converted to a freight yard. Late 19th/early 20th century maps show development along Cambridge Street within the APE including two large railroad roundhouses and the Boston Gas Light Company complex. During the early to mid-20th century, dozens of railroad siding tracks were constructed throughout the APE. By the mid-1960s, the I-90 corridor extended through the eastern, northern and western portion of the APE, including the site of the former railroad roundhouses.

Hazardous material studies indicate the APE has been contaminated by activities associated with the rail yard, the industrial gas companies and the interstate. Additional historical uses within the APE include auto shops and filling stations located along Cambridge Street. The reported hazardous material releases within the APE include petroleum products (diesel fuel, cable oil, hydraulic oil) and select metals (lead, chromium, arsenic) typically related to transportation/industrial activities and urban fill.

The proposed Project will not affect any potentially significant archaeological resources based on the results of the archaeological surveys in the area, the historic filling and development of the riverfront area, and the extensive disturbance and contamination related to railroad, industrial and interstate construction and use within the APE.

4.6.3 Section 4(f) Historic

Section 4(f) properties include publicly or privately owned historic sites listed in or eligible for listing in the NRHP. Historic sites are typically identified during the process required under Section 106, in consultation with the Massachusetts State Historic Preservation Officer and appropriate federal agencies. For the purposes of this DEIR, the above-identified NR-listed and NR-eligible properties will be considered Section 4(f) properties, however, final determination will be dependent upon the completion of the Section 106 process.

Following is a list of properties within the APE that either are listed in or appear eligible for listing in the National Register and therefore meet the criteria for consideration as historic sites under Section 4(f):

- NR-listed Charles River Basin Historic District
- NR-listed Harvard Avenue Historic District
- NR-listed Peter Fuller Building, 808 Commonwealth Avenue, Brookline
- NR-eligible Nickerson Field Entrance/Boston Braves Baseball Field Office and Gatehouse, 10-20 Gaffney St, Boston
- NR-eligible Packard's Corner Area

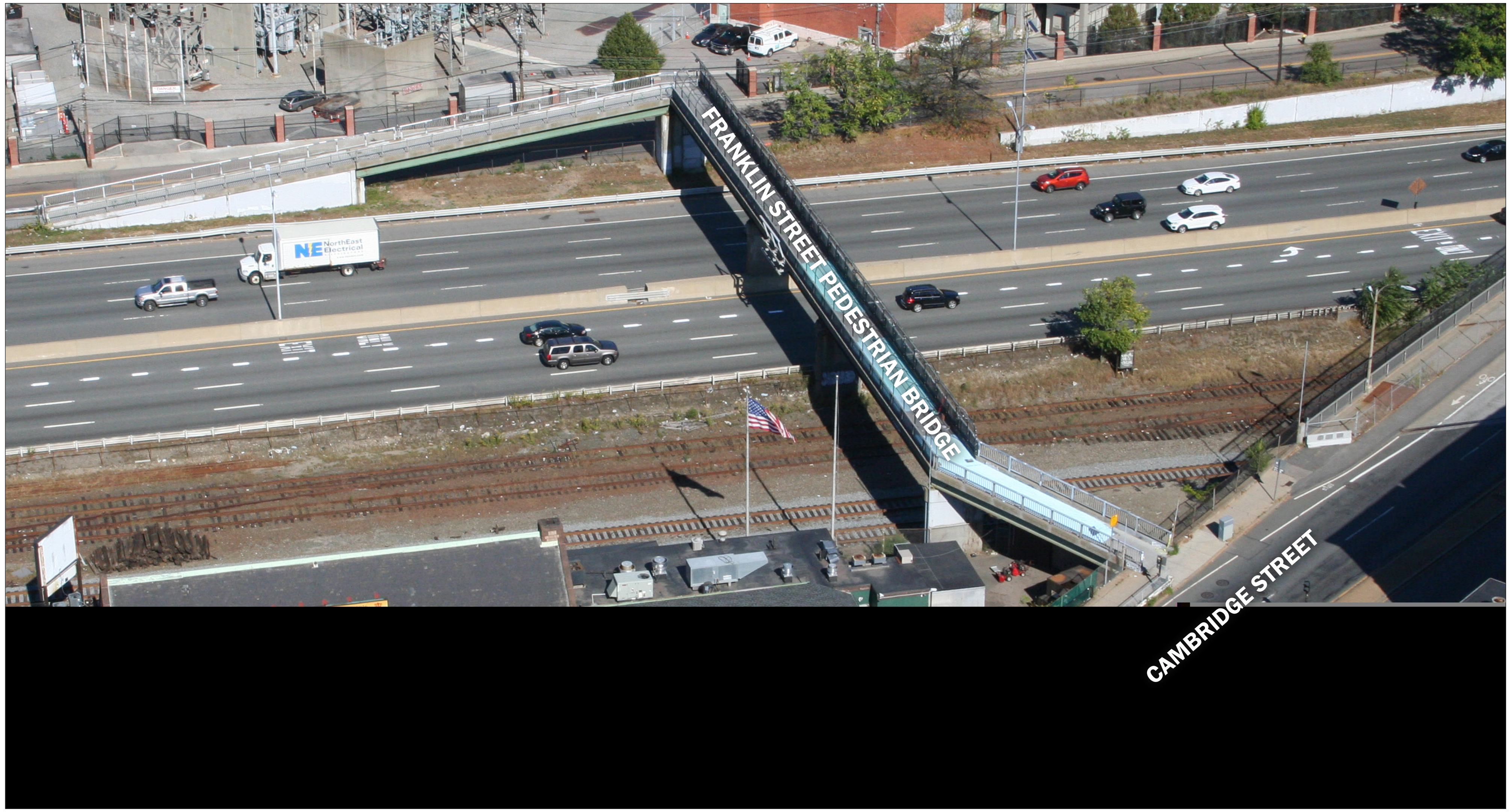
4.7 Pedestrian & Bicycle

4.7.1 Existing Bicycle Facilities

Existing pedestrian bicycle facilities within the vicinity of the Allston Interchange are illustrated on Figure 4.7-1 and Figure 4.7-2.

The Allston Interchange is located in a highly urbanized area within the City of Boston. The existing ramp system connects to the Cambridge Street/River Street corridor, an arterial roadway serving Boston and Cambridge. Because of the urban nature of the area, the vast majority of streets have sidewalks on both sides, including the major arterials in the Project Area such as Cambridge Street, Harvard Avenue, North Harvard Street and Western Avenue. Crosswalks, wheelchair ramps and pedestrian signals are provided at every signalized intersection with the Study Area; crosswalks and wheelchair ramps are provided at many of the un-signalized intersections along the North Harvard Street and Western Avenue corridors. There are a few exceptions; however, including the following locations:

- **Cambridge Street at SFR westbound off ramp/Service Road/I-90 off-ramp (DCR):** There is no pedestrian signal equipment. Wheelchair ramps are missing on most corners, and crosswalks are missing at the Cambridge Street/I-90 ramps signal.
- **North Harvard Street at SFR eastbound ramps (DCR):** No wheelchair ramps on the south side of the intersection.



The Franklin Street Pedestrian Bridge will be replaced as part of the Project

- **Cambridge Street at I-90 on-ramps (MassDOT):** No crosswalk or wheelchair ramps provided to connect existing sidewalks on the south side of Cambridge and the I-90 on-ramp.

MassDOT is in the process of designing interim improvements at the intersection of Cambridge Street and the SFR ramps/Service Road/I-90 off-ramps to address pedestrian signal and accessibility issues at this location, in advance of the implementation of the Allston Interchange Project.

Also within the Project Area is DCR's PDW Path, a shared-use facility located along the south bank of the Charles River between the river bank and SFR. The paved path averages 8.5 feet in width. There is a pedestrian/bicyclist pinch point referred to as "the Narrows" along the PDW Path at the River Street Bridge and the SFR westbound off-ramp. This pinch point, coupled with the lack of appropriate pedestrian accessibility features at this intersection, results in an unfriendly and challenging environment for pedestrians and bicyclists.

Franklin Street Pedestrian Bridge

The Franklin Street Pedestrian Bridge passes over I-90 connecting North Allston to Allston Village. This pedestrian bridge will be replaced as part of the Project. The bridge is located west of the Cambridge Street overpass and links Franklin Street and Cambridge Street to the south with Franklin Street and Lincoln Street to the north. Counts were conducted on the pedestrian bridge in June 2014 to determine pedestrian/bicycle use of the facility. The data indicate that approximately 1,250 pedestrians and 500 cyclists use this bridge on a daily basis.

The southern end of the pedestrian bridge meets the Cambridge Street sidewalk at a point near the Cambridge Street bridge abutment. The pedestrian bridge structure is a steel beam supported concrete deck with four concrete piers located at both ends, in the median of the Turnpike, and adjacent to the railroad tracks. A tall chain link fence, with an inward-curving top, is located on both sides of the bridge inside of the railings. The bridge is 240 feet long; the ramp on the Lincoln Street end is 175 feet; the ramp on the Cambridge Street end is 50 feet. The clear width of the walkway is 9 feet 9 inches on both the bridge and ramps, which are bordered by a 13-inch-wide raised curb. The total width of the structure is approximately 12 feet.

While the bridge itself is relatively flat, several connecting elements exceed recommended standards for accessibility. The ramp connecting the southern end of the bridge to the Cambridge Street sidewalk exceeds a 13% slope. Further, the slope of Cambridge Street and its sidewalk exceeds 5% between the intersection at Franklin Street and the ramp connection. The northern end of the bridge is connected to Lincoln Street at the end of Franklin Street by a straight ramp with a slope exceeding 11%.

The existing bridge does not meet current Americans with Disabilities Act (ADA) accessibility requirements because of slopes greater than 5% on the ramp connecting from the Cambridge Street sidewalk to the bridge, and on the ramp that connects the bridge to Lincoln Street at Franklin Street. The bridge also does not meet current MassDOT bikeway design standards. The goal of the new pedestrian and bicycle bridge is not only to comply with ADA requirements but also to create a direct connection between the commercial districts along Harvard Street to the residential neighborhood in North Allston.

Existing AM and PM peak hour pedestrian volumes are shown on Figure C-6 (a-c) and Figure C-7 (a-c), which can be found in Appendix C, Traffic Operations Study.

Existing Bicycle Facilities

The Cities of Boston and Cambridge have installed various types of bicycle facilities in the vicinity of the Allston interchange to better accommodate the increase in bicycle use in the area, including separated bicycle facilities on Cambridge Street and Western Avenue in Boston, and on Western Avenue in Cambridge. Additionally, bicycle lanes have been installed on North Harvard Street and Western Avenue by the City of Boston.

South of the interchange, bicycle lanes have been installed along Commonwealth Avenue, Harvard Avenue and Babcock Street. Shared lanes have been designated by the City of Boston along Brighton Avenue. In the future, the bicycle lanes along Commonwealth Avenue, (from approximately Packards Corner to the BU Bridge), will be replaced with separated bicycle facilities when reconstruction of that segment of roadway is completed.

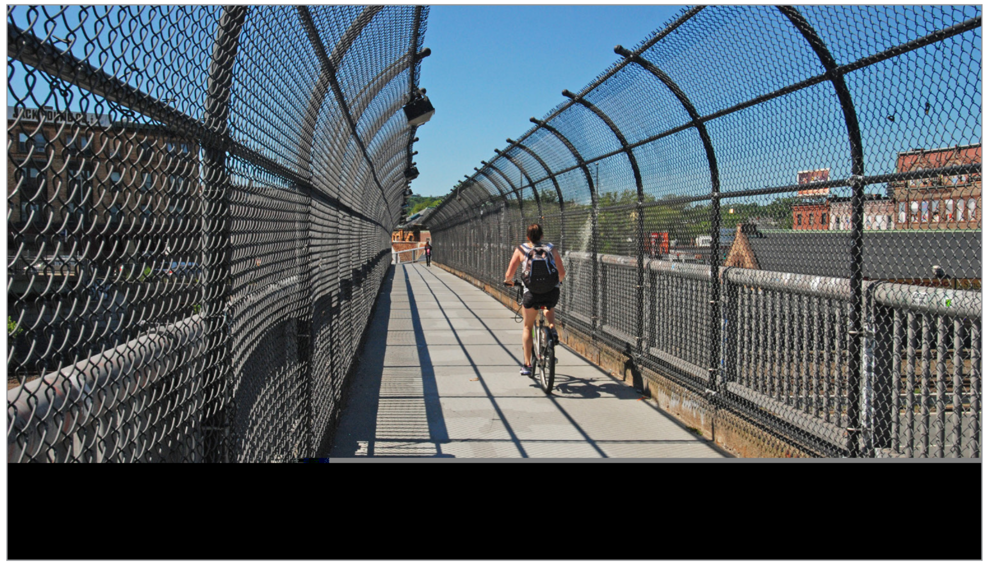
Along both banks of the Charles River and within the Charles River Reservation, the DCR owns and operates a shared-used path known as the PDW Path. The path is an approximately 18-mile bicycle and pedestrian loop located on both sides of the Charles River that extends from North Point Park in Cambridge and the Nashua Street Park in Boston, upstream to Watertown Square in Watertown. Within the Project Area, the path averages 8.5 feet in width and is a paved asphalt surface. It is located between SFR and the south bank of the Charles River.

The newer bicycle facilities in Boston and Cambridge provide connections to the historic shared-used paths along the Charles River Reservation to form the foundation of what the two cities envision will eventually be an extensive urban bicycle network in the Allston area.

The ramp connecting the bridge to Lincoln Street exceeds 11%

The sidewalk along Cambridge Street exceeds 5%

The ramp connecting the bridge to Cambridge Street exceeds 13%



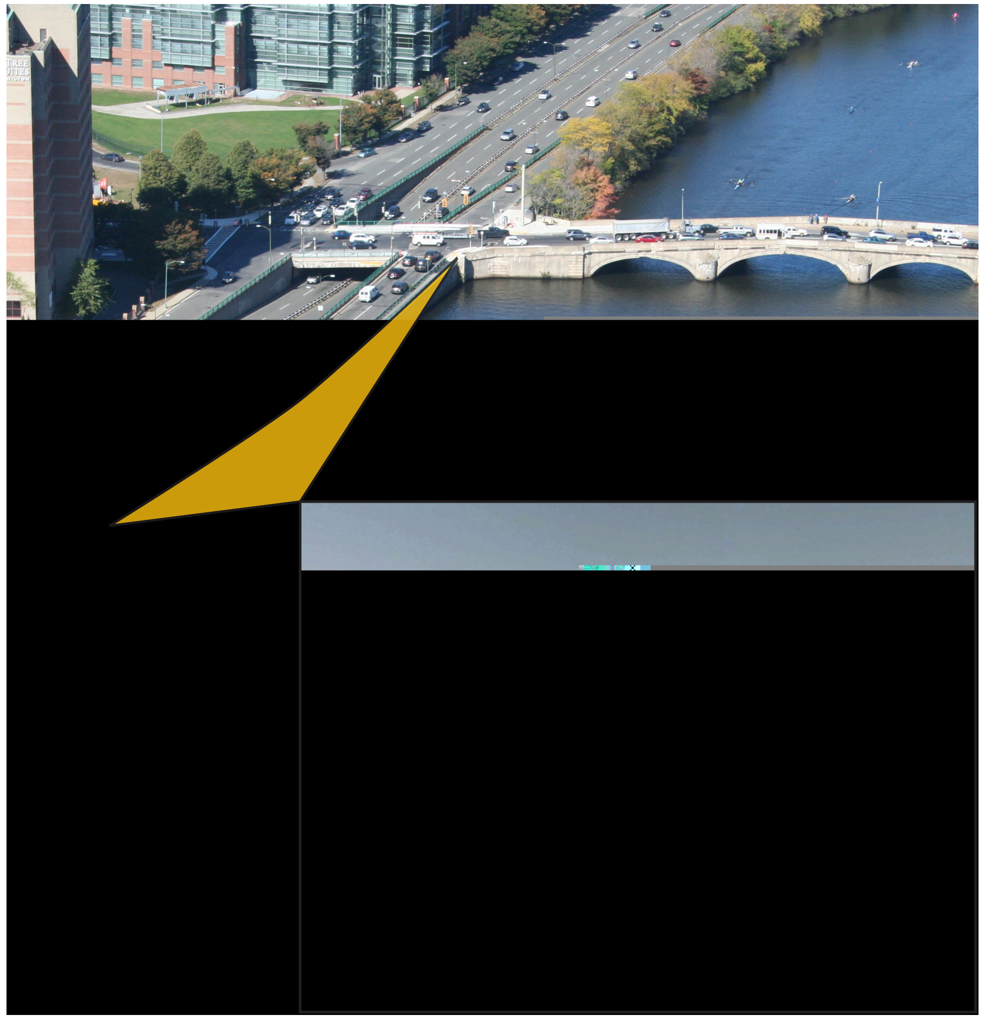
The existing Franklin Bridge pedestrian and bicycle bridge across I-90 provides an important connection between North Allston and Allston Village

Rail Yard and Worcester Main Line

The rail yard is active and not open to the public. It does not provide public pedestrian or bicycle access. The yard perimeter is fenced, with gated access available to authorized personnel from a roadway entrance connecting to Cambridge Street and Lincoln Street. The Worcester Main Line is an active railroad corridor and does accomodate public pedestrian or bicycle access.

Because of the lack of bicycle or pedestrian access across the rail lines and yard, the Cambridge Street Bridge is the primary route within the Project Area for pedestrians and bicycles to cross the Worcester Main Line and I-90. The overpass currently lacks separated and well functioning bicycle and pedestrian access. Jersey barriers separate cyclists and pedestrians from vehicular traffic, and the travel surface is uneven and degraded. The bridge deck does not comply with ADA standards because of steep grades. It has suffered substantial deterioration. Plans to replace the deck and improve the Cambridge Street Bridge are currently underway. MassDOT worked with key stakeholders and Allston residents and representatives to develop a plan that includes a series of vehicle, pedestrian and bicycle design modifications.

Existing AM peak hour bicycle volumes within the primary and secondary study areas are presented on Figure C-1-6 (a-c) in Appendix C, Traffic Operations Study. PM peak hour bicycle volumes are shown on Figures C-1-7 (a-c).



The "Narrows" The PDW Path at the approach to the River Street Bridge

Hubway

In addition to the various bike lanes and bike paths in the vicinity of the Allston Interchange, the Hubway bike share system is available to bicyclists in the area. Within the Study Area there are currently three Hubway Stations located at:

- 175 North Harvard Street (18 bicycles/docking stations);
- 125 Western Avenue at Batten Way (14 bicycles/docking stations); and
- 111 Western Avenue at Soldiers Field Park (15 bicycles/docking stations).

In the area south of the interchange, there are two additional Hubway stations located at:

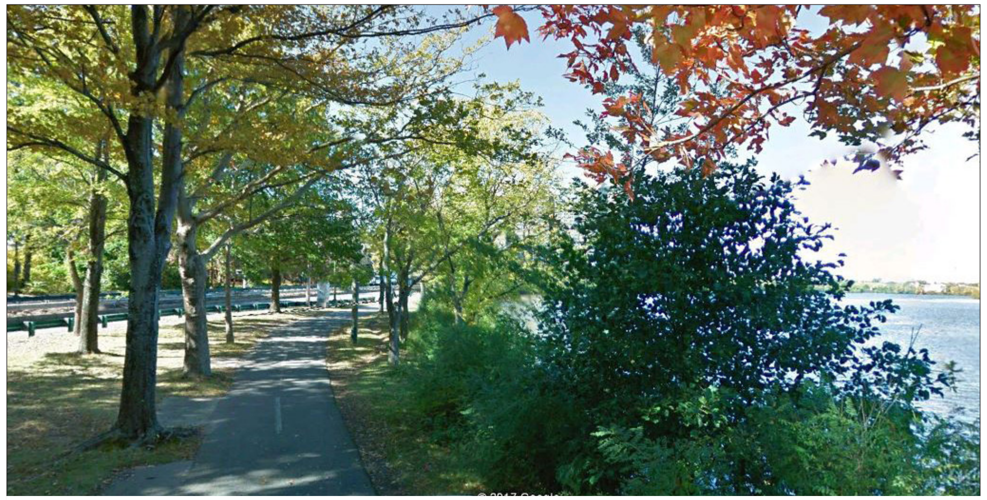
- Commonwealth Ave. at Packards Corner (18 bicycles/docking stations); and
- 925 Commonwealth Ave. at the Agganis Arena (15 bicycles/docking stations).

An interactive map of all the Hubway stations within the metro Boston area can be viewed at the following website: https://secure.thehubway.com/map.

4.7.2 Bicycle/Pedestrian Connectivity

There are several crossings of the Charles River in the vicinity of the Project Area that can be used by bicyclists and pedestrians to travel between Boston and Cambridge, including the BU Bridge, the River Street Bridge, the Western Avenue Bridge, the Lars Anderson Bridge and the Weeks Footbridge. Bicyclists and pedestrians from the North Allston or Allston Village neighborhoods traveling to/from Cambridge, or the Charles River Reservation, tend to use the Cambridge Street corridor rather than Western Avenue corridor because of its geographic proximity to these neighborhoods. This means that these users have to travel through the pedestrian/bicyclist-unfriendly environment that exists at the intersection of Cambridge Street/I-90 off-ramps/SFR ramps and the SFR Service Road. This trip also requires them to travel over the bridge structure that carries Cambridge Street over the I-90 ramp system. With rather steep approach grades, this bridge can be a challenge for bicyclists and pedestrians to traverse. One of the primary goals of this Project is to improve the pedestrian/bicyclist environment all along the Cambridge Street corridor. Another goal is to eliminate the Narrows, or pinch point, at the intersection of Cambridge Street and the SFR westbound off-ramp.

The Project will also address is the lack of a direct pedestrian/bicycle connection from the Allston residential neighborhoods south of the interchange (i.e., Ashford Street/Packards Corner area) and the Charles River Reservation or the City of Cambridge because of the functional barrier created by BPY, Worcester Main Line tracks and the I-90 interchange ramps. Currently, pedestrians and bicyclists traveling from this area must either "back track" from their neighborhood to Linden Street or Harvard Avenue in order to access Cambridge Street to then travel down to the Charles River, or travel east along Commonwealth Avenue to the BU Bridge to cross the Charles River into Cambridge. The BU Bridge route provides access to the pedestrian/bicycle facilities on the Cambridge side of the Charles River Reservation, but not to the Boston side. To access the PDW Path on the Boston side of the river, users must travels further east to Bay State Road or Back Street, where pedestrian bridges over SFR are provided.



PDW Path

Consequently, a key goal of the Project is to provide a more direct, north-south pedestrian/bicycle connection from the neighborhoods south of the Project Area to the Charles River.

4.8 Traffic & Safety

4.8.1 Highway

4.8.1.1 Regional Context & Significance

The I-90 Allston Interchange (Exits 18, 19 and 20) is situated within the site historically known as BPY. The interchange is strategically located within the urban core of the Boston Metropolitan Area and on the primary east-west highway corridor within the metropolitan area (and in the state). The Project Area includes a railroad ROW that serves the Worcester Main Line of the MBTA Commuter Rail service, AMTRAK and freight service. The land on which the Project is located is owned by an entity controlled by Harvard University, and MassDOT and the MBTA operate the highway and rail transportation facilities under their existing rights in the land.

There are a number of reasons why so many drivers and trucks use this interchange:

- There are few alternative routes.
- Geographically, the urban Allston Interchange is located a substantial distance from adjacent I-90 interchanges. It is located approximately 3.2 miles east of Exit 17 (Watertown, Newton Corner) and approximately 2.4 miles west of Exit 22 (Copley Square).
- It provides connections to several regional roadways, critical parkways or urban arterials including SFR/Storrow Drive, Memorial Drive and Cambridge Street.
- There is a significant population living within a short travel time of the interchange. Approximately 180,000 people live within a two-mile radius of the interchange (about a 10 to 15 minute trip), including the Allston, Brighton and Kenmore/Fenway neighborhoods of Boston, most of the City of Cambridge and parts of the Towns of Brookline and Watertown.
- Many significant regional employers and employment centers are located within a two-mile radius of the interchange, including Harvard University, BU, MIT, Kendall Square, Longwood Medical and Academic Area (LMA), Watertown Arsenal Redevelopment Area, St. Elizabeth's Hospital and New Balance Corporate Headquarters.
- Because of the interchange's connection to SFR/Storrow Drive, many drivers traveling to/from the Massachusetts General Hospital (MGH) and the Kenmore Square/Fenway areas of Boston also use this interchange.

The Project is located adjacent to lands that are planned to be redeveloped by Harvard University as an "Enterprise Zone." This zone is in Boston, in the area north of Cambridge Street and south of Western Avenue, and between the North Allston neighborhood and the Charles River. Additionally, Harvard University expects to redevelop the BPY after the Project reconfiguration of the I-90 mainline and ramp alignments. In the long-term, the redevelopment of the BPY by Harvard could include several air rights parcels over I-90 and the interchange's ramp system. Although the exact quantities of redevelopment are not known at this time, between the Enterprise Zone, BPY and air rights parcels, Harvard anticipates that a significant level of development will occur within the Project Area and immediate environs. Consequently, MassDOT recognizes that a multi-model approach to the reconstruction of the Allston Interchange is critical for the long-term sustainability of the Project, and for the redevelopment that is expected to occur in the area as a result of the Project.

The regional context of the Allston Interchange is illustrated in Figure 4.8-1. The regional nature of the users getting on or off I-90 at this interchange are illustrated in Figure 4.8-2 through Figure 4.8-6. These maps are based on origin/destination data developed by the Central Transportation Planning Staff (CTPS), which is the agency that provides technical and modeling support to the Boston Metropolitan Planning Organization (MPO) and MassDOT for transportation projects within the region.

I-90 is one of the busiest highways in the state, serving approximately 154,000 vehicles per day in the vicinity of the Allston interchange. Approximately 65,000 to 70,000 vehicles per day use the Allston interchange ramps to access or egress I-90. I-90 also carries a significant amount of commercial truck traffic (approximately 8,000 trucks per day) due in part to the fact that I-90 runs the entire length of the state, serves the other major cities within the Commonwealth (i.e., Worcester, Springfield), and has direct connections to other interstate highways (I-95, I-495, I-290, I-84 and I-91) in the state that bring goods to the region from other parts of the state and the country.

Figure 4.8-2, for example, illustrates the destinations of all drivers exiting I-90 from the eastbound and westbound off-ramps on a daily basis. The data shows a higher density of destinations in Allston, Brighton, Cambridge and Brookline, which is not unexpected. However, as noted previously, there are also many drivers using the interchange that have destination in the LMA, the Fenway, Back Bay and MGH/Beacon Hill neighborhoods of Boston, as well as eastern Watertown and Somerville. Other, lesser density destinations are also shown on the map including Charlestown, Everett, Malden, Medford and Belmont.

Figure 4.8-3 shows the origins of the daily drivers using the off-ramps to travel to the destinations noted above. The origins of the eastbound off-ramp users are communities located generally to the west and south of the interchange, with the highest density of drivers coming from communities along the I-90/Route 128 (I-95) corridors including Newton, Weston, Wellesley, Needham, Waltham, Natick and Framingham. Figure 4.8-3 also shows that higher densities of origins for the users of the eastbound off-ramp are dispersed among a total of 34 communities located west/south of the interchange.

In terms of the origins of the users of the westbound off-ramp, those origins are located to the east and south of the interchange, along the I-93 (Southeast Expressway)/Route 3 corridor. Communities with the highest densities of origins on the westbound off-ramp include East Boston (including Logan Airport), South Boston, Dorchester, Quincy, Milton, Braintree and Weymouth. In total, drivers using the westbound off-ramp at the Allston interchange have origins in a total of 14 communities to the east/south of the interchange.

The origins of the drivers accessing I-90 via the Allston on-ramps on a daily basis are illustrated on Figure 4.8-4. Figure 4.8-4 indicates that the highest proportion of on-ramp users originate in Allston, Brighton, Brookline Cambridge and east Watertown. Similar to the I-90 off-ramp destinations, there is also a high density of users getting on the highway from Belmont, Somerville Charlestown, Everett and the MGH/Beacon Hill neighborhood of Boston.

The destinations of the existing “local” drivers getting on I-90 in Allston are presented on Figure 4.8-5. Drivers getting on the highway via the westbound on-ramp are destined to employment centers in communities along the I-90 (Newton, Natick, Framingham) and Route 128 (Weston, Wellesley, Needham) corridors. The data also indicates that there are many local drivers traveling to jobs along the Route I-495 corridor who will require trips along I-90 to I-495 to local highways such as Route 9 or Route 20. The primary destinations of the local drivers accessing the highway via the eastbound on-ramp include East Boston (Logan Airport), South Boston, Dorchester, Quincy and Braintree.

The existence of the vehicular travel connections between the residential communities in the vicinity of Allston Interchange and the employment centers located in the suburbs west, south and east of Boston, as shown on Figure 4.8-5 (daily traffic), are corroborated when reviewing the origin/destination data for the I-90 on-ramps during the AM and PM peak periods. This information is shown on a series of maps provided in Appendix C, Traffic Operations Study.

Also provided in Appendix C is a series of maps illustrating the origin/destination data for trucks using the Allston interchange during the AM, PM and daily time periods. Figure 4.8-6 presents the destinations of truck trips getting off the highway at the Allston Interchange on a daily basis. It shows that truck trips passing through the interchange have destinations in most neighborhoods of Allston, Brighton, Cambridge, Somerville, Brookline and east Watertown, as well as in the Fenway, LMA and MGH/Beacon Hill areas of Boston.

The CTPS truck data represents a wide range of truck trip types, including trips such as deliveries of goods to grocery stores, contractors traveling to local residences to perform services, or UPS/FedEx trucks making deliveries to homes or businesses.

The bottom line is that the Allston interchange serves a critical regional function in providing highway connections between local residential areas and suburb employment centers, as well as for the safe and efficient movement of goods and services into and out of the local area. Thus, a multi-modal approach to the redesign of the interchange, (including appropriate accommodations for motorized vehicles), is instrumental in assuring the long-term success of the Project.

4.8.1.2 Existing Roadway Network

The Project Area, which encompasses BPY, is approximately bounded by Ashford Street to the south, SFR and the BU Bridge to the east, and Cambridge Street to the north and west. The Project limit to the west on I-90 includes the Lincoln Street pedestrian bridge over I-90, while the limit to the east on I-90 is the Commonwealth Avenue Bridge. Within these boundaries, the Project Area includes the I-90 mainline, the Allston Interchange which include Exits 18 and 20, a major local arterial (Cambridge Street) and its intersections, as well as active and inactive railroad facilities in BPY. Within the Project Area, I-90 is partially at-grade, partially carried on embankment sections, and partially on a viaduct structure. The Project Area also includes SFR, an historic parkway, and the adjacent PDW Path, a shared-use path along the banks of the Charles River.

The existing roadway network that serves traffic traveling on I-90, accommodates traffic entering/exiting the highway, or traffic traveling to/from the highway on local roadways that have been evaluated for this study include the following facilities (with jurisdiction noted for the facility):

Highways

- I-90 eastbound mainline (MassDOT)
- I-90 westbound mainline (MassDOT)

Ramps

- I-90 eastbound on-ramp (MassDOT)
- I-90 eastbound off-ramp (MassDOT)
- I-90 westbound on-ramp (MassDOT)
- I-90 westbound off-ramp (MassDOT)

Local/Regional Roadways

Primary Traffic Study Area

- SFR (DCR)
- Memorial Drive (DCR)
- Cambridge Street (City of Boston)
- North Harvard Street (City of Boston)
- Western Avenue (City of Boston)
- Harvard Avenue (City of Boston)
- Linden Street (City of Boston)

Secondary Traffic Study Area

- Commonwealth Avenue (City of Boston)
- Brighton Avenue (City of Boston)
- Malvern Street (City of Boston)
- Ashford Street (City of Boston)
- Babcock Street (City of Boston)
- Gardner Street (City of Boston)
- Alcorn Street (City of Boston)

Project Study Area Intersections

Critical intersections along the local/regional roadways that provide access/egress to the I-90 existing ramp system that have been evaluated for this study include:

Primary Traffic Study Area – See Figure 4.8-7

1. Cambridge Street at Harvard Avenue (City of Boston)
2. Cambridge Street at Lincoln Street (City of Boston)
3. Cambridge Street at North Harvard Street (City of Boston)
4. Cambridge Street at Windom Street (City of Boston)
5. Cambridge Street at I-90 eastbound/westbound off-ramps/SFR (DCR)
6. River Street at Memorial Drive (DCR)
7. Western Avenue at North Harvard Street (City of Boston)
8. Western Avenue at Hague Street/Batten Way (City of Boston)
9. Western Avenue at SFR (DCR)
10. Western Avenue at Memorial Drive (DCR)
11. North Harvard Street at SFR EB Ramps (DCR)
12. North Harvard Street at SFR WB Ramps (DCR)
13. North Harvard Street at Memorial Drive/JFK Street (DCR)
14. Cambridge Street at Linden Street (City of Boston)

15. Cambridge Street at Sorrento Street (City of Boston)
16. Cambridge Street at Seattle Street (City of Boston)
17. North Harvard Street at Spurr Street (City of Boston)

Secondary Traffic Study Area – See Figure 4.8-7

18. Harvard Avenue at Brighton Avenue (City of Boston)
19. Brighton Avenue at Linden Street (City of Boston)
20. Brighton Avenue at Commonwealth Avenue/Malvern Street (City of Boston)
21. Commonwealth Avenue at Babcock Street (City of Boston)
22. Commonwealth Avenue at Pleasant Street/Harry Agganis Way (City of Boston)
23. Commonwealth Avenue at St. Paul Street/Buick Street (City of Boston)
24. Ashford Street at Malvern Street (City of Boston)
25. Gardner Street at Malvern Street (City of Boston)
26. Ashford Street at Alcorn Street (City of Boston)
27. Gardner Street at Alcorn Street (City of Boston)
28. Ashford Street at Babcock Street (City of Boston)
29. Gardner Street at Babcock Street (City of Boston)

The Secondary Traffic Study Area was included in the traffic analyses for the DEIR to evaluate a potential new roadway connection between the Allston interchange and the Commonwealth Avenue/Packards Corner area of Boston/Brookline as part of the Project's alternatives analysis. Traffic analysis for intersections within the secondary Study Area is limited to the interchange alternatives analysis of the future Build conditions, therefore, intersection level of service results are not reported within this area for the Existing and No Build analysis cases.

Appendix C, Traffic Operations Study, provides additional information regarding the Study Area including:

- **Figures C-1-1 (a-c):** Existing roadway jurisdiction and intersection traffic controls types within the primary and secondary traffic Study Areas (illustrated schematically).
- **Figures C-1-2 (a-c):** Existing Functional Classification of the roadway facilities within the primary and secondary Study Areas (i.e., interstates, arterials, local roadways, etc.).
- **Figures C-1-3 (a-d):** Existing lane configurations on roadways and on intersection approaches within the primary and secondary Study Areas.

4.8.1.3 Existing Traffic Volumes

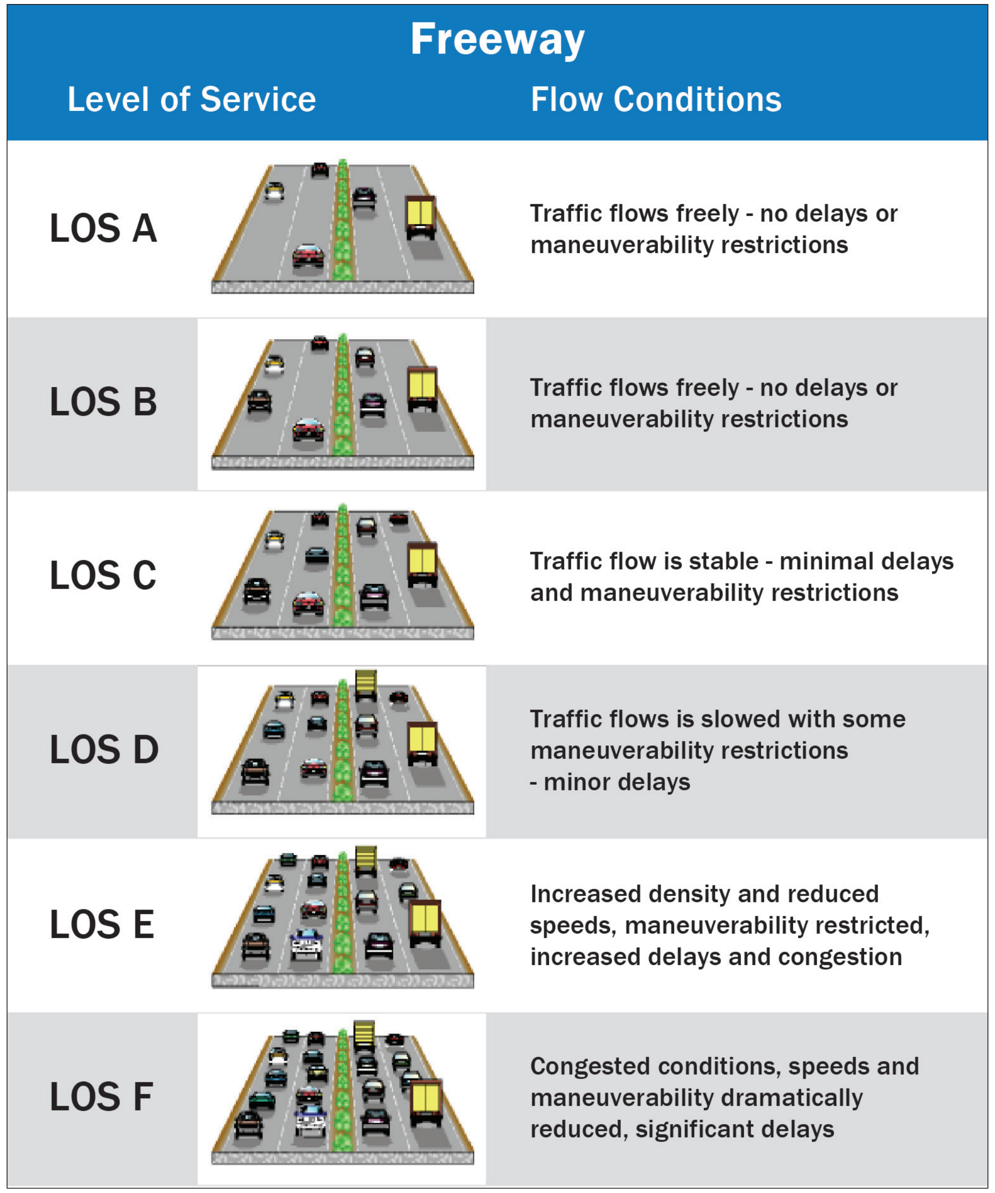
The volumes used to evaluate the existing highway, ramp junction and local roadway operations were collected from several sources during the time period between 2012 and 2015. The data sources included:

- I-90 Toll Plaza data (toll receipts/AVI records)
- Automatic Traffic Recorder (ATR) data on the I-90 ramps and local streets
- Peak hour turning movement and vehicle classification counts at local intersections
- Peak hour pedestrian counts at local intersections (crosswalk crossings)
- Peak hour bicycle counts at local intersections

The traffic count data used for this study was collected prior to the removal of the I-90 mainline and ramp toll plazas in late 2016 as part of MassDOT's conversion to AET in Massachusetts. Details regarding the various traffic count programs (type, date, location) are provided in Appendix C, Traffic Operations Study.

The traffic count data from 2012 – 2014 were increased by 0.25% per year to reflect the existing conditions analysis year of 2015 to account for traffic growth that may have occurred since those counts were performed. The count data was also seasonally adjusted to reflect average annual conditions, and in the case of the 2012 – 2014 data, the volumes were seasonally adjusted prior to being increased to 2015. Copies of the count data and a summary of the adjustments made to the raw count data are also provided in Appendix C, Traffic Operations Study.

2015 AM and PM peak traffic volumes within the primary and secondary Study Areas are illustrated on Figures C-1-4(a-d), and Figures C-1-5(a-d) in Appendix C, Traffic Operations Study.



Freeway

Level of Service		Flow Conditions
LOS A		Traffic flows freely - no delays or maneuverability restrictions
LOS B		Traffic flows freely - no delays or maneuverability restrictions
LOS C		Traffic flow is stable - minimal delays and maneuverability restrictions
LOS D		Traffic flows is slowed with some maneuverability restrictions - minor delays
LOS E		Increased density and reduced speeds, maneuverability restricted, increased delays and congestion
LOS F		Congested conditions, speeds and maneuverability dramatically reduced, significant delays

Graphic 4.8-1: Level of Service. Source: 2010 Highway Capacity Manual, Caltrans

4.8.1.4 Traffic Analysis Methodologies

The various traffic analyses undertaken for this study were performed in accordance with the methodologies set forth in the latest version of the *Highway Capacity Manual* (HCM 2010). Those methodologies are summarized below.

Level of Service (LOS) is a term used to describe the quality of the traffic flow on a roadway facility at a particular point in time. It is an aggregate measure of travel delay, travel speed, congestion, driver discomfort, convenience and safety based on a comparison of roadway system capacity to roadway system travel demand. Operating levels of service are reported on a scale of A to F, with LOS A representing the best operating conditions and F representing the worst operating conditions. Graphic 4.8-1 shows highway traffic flow conditions based on LOS. Depending upon the type of facility being analyzed, LOS A represents free-flow or uncongested conditions with little or no delay to motorists, while LOS F represents a forced-flow condition with long delays and traffic demands exceeding roadway capacity.

LOS D is typically cited as the design standard for suburban roadways, with LOS E conditions often cited as the minimum standard in urban areas. However, when trying to establish minimum acceptable LOS thresholds for existing roadways, a number of factors must be considered. These factors include existing operating levels of service on other similar and nearby facilities, the duration of the peak traffic periods, the feasibility and cost of providing traffic mitigation, and applicable state and local regulations.

The types of facilities analyzed for the Project include highway segments and ramp junctions on I-90 and local intersections (signalized and unsignalized). The following paragraphs describe the specific criteria used to evaluate the operation of each facility type.

Highway Segments

Highway segment operations are based on the density of vehicles in that segment on a per lane basis. Highway levels of service were calculated following the methodologies defined in the 2010 *Highway Capacity Manual*. LOS A-E assume that the vehicle demand flows do not exceed capacity. LOS F occurs when the highway exceeds the capacity of the highway segment. Table 4.8.1 summarizes the relationship between the maximum traffic volume density and the LOS on the highway segment. For this study, Highway Capacity Software (version 6.3) was used to analyze peak hour operations on the I-90 mainline.

Table 4.8.1: Highway Segment Level of Service Criteria

Level of Service	Density (pc/mi/ln)[1]
A	≤ 11
B	>11-18
C	>18-25
D	>25-35
E	>35-45
F	Demand exceeds capacity

Source: Highway Capacity Manual 2010, Volume 2: Uninterrupted Flow, Transportation Research Board, The National Academies, Washington, DC, 2010. [1]pc/mi/ln = passenger cars per mile per lane

Ramp/Highway Junction Operations

A ramp/highway junction allows for high-speed merging or diverging with minimum disruption of the adjacent highway traffic. The LOS at a ramp/highway junction of an interchange is defined in terms of density of traffic volumes in the influence area of the ramp. Models were used to estimate density of traffic volumes based on independent variables such as the traffic flows entering the influence area and the length of acceleration or deceleration lanes. LOS A-E assume that the vehicle demand flows do not exceed capacity. LOS F occurs when the highway exceeds the capacity of the upstream (diverges) or downstream (merges) highway segment, or where the off-ramp demand exceeds the off-ramp capacity. Ramp junction operating levels of service are calculated following the methodologies defined in the *2010 Highway Capacity Manual*. Table 4.8.2 summarizes the relationship between the maximum traffic volume density and the LOS at a ramp junction. For this study, the Highway Capacity Software (version 6.3) was used to analyze peak hour operations at the I-90 ramp junctions.

Table 4.8.2: Merge/Diverge Level of Service Criteria

Level of Service	Density (pc/mi/ln)[1]
A	≤ 10
B	>10-20
C	>20-28
D	>28-35
E	>35
F	Demand exceeds capacity

Source: Highway Capacity Manual 2010, Volume 2: Uninterrupted Flow, Transportation Research Board, The National Academies, Washington, DC, 2010. [1]pc/mi/ln = passenger cars per mile per lane

Intersections

Intersection operating LOS are calculated following the methodologies defined in the *2010 Highway Capacity Manual* for signalized and unsignalized intersections. For both signalized and unsignalized intersections, the operating LOS is based on travel delays. Existing delays can be measured in the field but generally are calculated as a function of traffic volume, peaking characteristic of traffic flow, percentage of heavy vehicles in the traffic stream, type of traffic control, number of travel lanes and lane use, intersection approach grades, pedestrian activity, and signal timing, phasing and progression where applicable. The specific criteria applied per the *2010 Highway Capacity Manual* are summarized in Table 4.8.3. The calculated average delay per vehicle for signalized intersections applies to all vehicles entering the intersection and under control of the traffic signal. For unsignalized intersections, it is assumed that through movements on the main street have the right-of-way and are not delayed by side street traffic. Consequently, the total delay values for unsignalized intersections apply only to the major street left-turn movements or the minor street intersection movements, which must yield to oncoming traffic.

Table 4.8.3: Intersection Level of Service Criteria

Level of Service	Signalized Intersections	Unsignalized Intersections
A	≤ 10	≤ 10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

Source: Highway Capacity Manual 2010, Volume 3: Interrupted Flow, Transportation Research Board, The National Academies, Washington, DC, 2000.

For this study, the SYNCHRO 8.0 software was used to analyze peak hour operations at the study intersections. SYNCHRO 8.0 is a windows-based analysis tool that follows the procedures defined in the 2000 *Highway Capacity Manual*. Use of the 2000 *Highway Capacity Manual* (HCM) output from Synchro 8.0 was required for this analysis because the 2010 HCM methodology does not support intersections with exclusive pedestrian phasing, intersections with five approach legs or intersections with clustered controllers, some of which are present within the Project Study limits.

4.8.1.5 Existing Traffic Analysis Results

I-90 Highway Analysis

East and west of the Allston Interchange, outside the segments of the highway influence by the on- and off-ramps, the I-90 cross-section consists of four travel lanes in each direction. The existing peak hour volumes on these highway segments range between 5,000 vehicles per hour (vph) and 6,900 vph. As noted in Table 4.8.4, existing peak hour operations on these segments of I-90 generally function at LOS C or LOS D. The exception is the eastbound highway segment east of interchange (on the I-90 viaduct), which functions at LOS E in the AM peak hour. However, field observations indicate that I-90 eastbound mainline operations on the viaduct during the AM peak hour are typically congested and can be categorized as functioning at LOS F. This congestion is related to the friction caused on I-90 by the high volume of traffic entering the traffic stream from the two-lane on ramp from the Allston Interchange. Similarly, congestion often experienced by I-90 westbound drivers in the PM peak hour, west of the Allston Interchange, is a result of the friction caused by the high volume of traffic entering the westbound traffic stream from the Newton Corner westbound on ramp (Exit 17).

Copies of the existing highway operations analysis calculation sheets are provided in Appendix C, Traffic Operations Study.

Table 4.8.4: Existing I-90 Highway Segment Operations

	AM Peak Hour		PM Peak Hour	
Location	Density[1]	LOS[2]	Density[1]	LOS[2]
I-90 Eastbound				
West of Exit 18 Off-Ramp	33.9	D	24.3	C
East of Exit 20 On-Ramp	38.6	E	23.9	C
I-90 Westbound				
East of Exit 20 Off-Ramp	24.8	C	26.5	D
West of Exit 18 On-Ramp	23.8	C	26.9	D

1 pc/mi/ln=Passenger Cars per Mile per Lane
2 LOS=Level of Service
** Field observations indicate that the EB direction of I-90 on the viaduct functions at LOS E/F in the AM peak hour because of the friction caused by the two lane on-ramp traffic merging into the mainline traffic stream, and that the WB direction west of the interchange functions at LOS D/E during the PM peak hour due to ramp friction at Exit 17.*

I-90 Ramp Junction Analysis

Existing I-90 ramp junction operations are summarized in Table 4.8.5. The lane configuration at the ramp junctions at the Allston Interchange are atypical in that there is a "lane drop" through the interchange downstream of the off-ramps (4 lanes to 3 lanes), and there is an "add lane" downstream of the on-ramps (3 lanes to 4 lanes). Because of this configuration, the on-ramp junctions at the Allston Interchange cannot be exactly replicated in the software associated with the 2010 HCM. Therefore, based on consultation with the Highway Capacity and Quality Service Committee, the densities reported in Table 4.8.5 for the merge operations for the area immediately downstream of the on-ramps are based on 2010 HCM highway segment methodology.

As noted in Table 4.8.5, existing ramp junction operations are generally LOS C or LOS D during the peak hours at the interchange with the exception of the area downstream of the eastbound on-ramp in the morning peak, which functions at a LOS E. It is also important to note that the eastbound off-ramp is a left-hand ramp (from the high speed lane) instead of the traditional right-hand off-ramp configuration. One of the goals of the Project is to improve this situation and provide a traditional right hand off-ramp from the low speed lanes in the eastbound direction when the interchange is reconfigured.

Copies of the existing highway ramp junction analysis calculation sheets are provided in Appendix C, Traffic Operations Study.

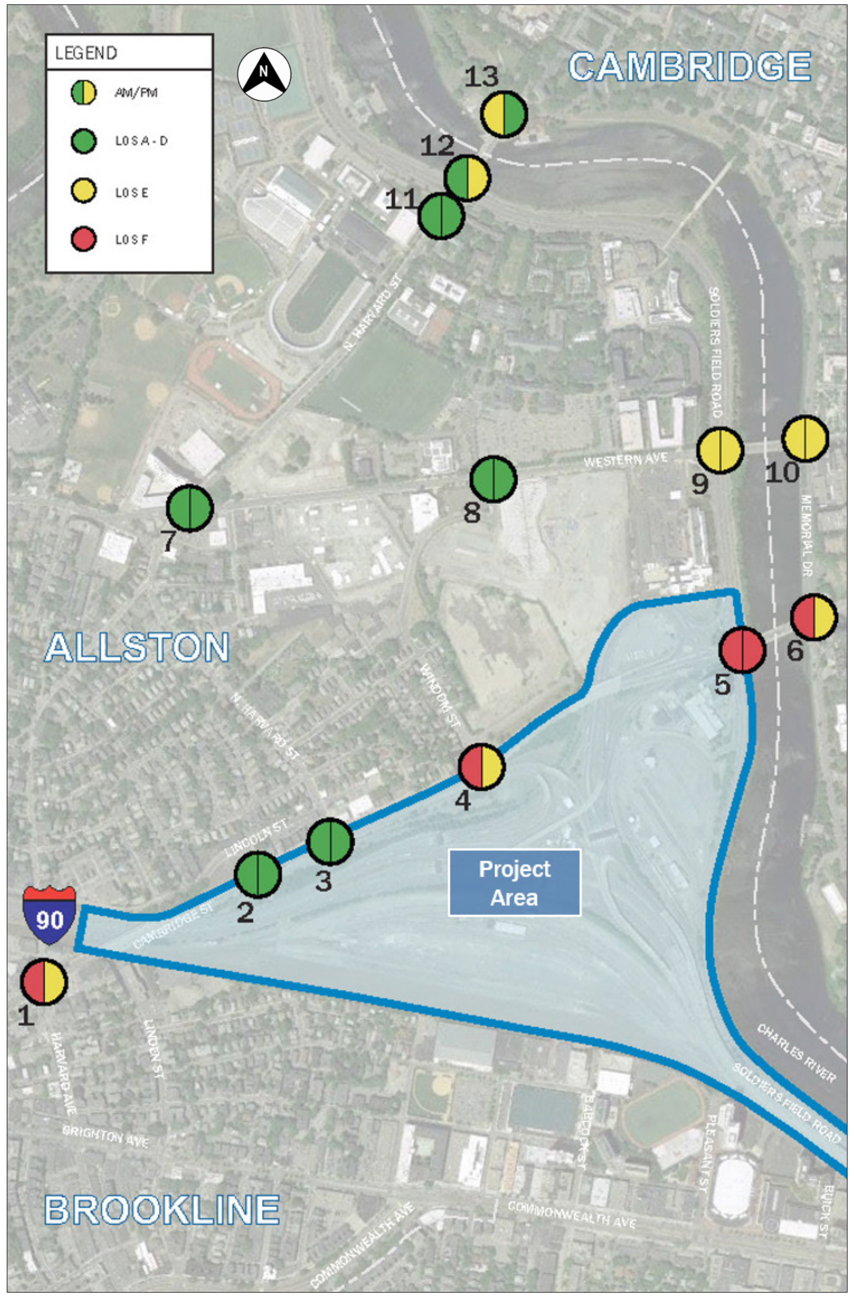
Table 4.8.5: Existing I-90 Ramp Junction Operations

	AM Peak Hour		PM Peak Hour	
Location	**Density[1]**	**LOS[2]**	**Density[1]**	**LOS[2]**
I-90 Eastbound				
Diverge (Exit 18 Off-Ramp)	34.1	D	25.5	C
Merge (Exit 20 On-Ramp)[3]	38.6	E	23.9	C
I-90 Westbound				
Diverge (Exit 20 Off-Ramp)	26.1	C	27.7	C
Merge (Exit 18 On-Ramp)[3]	23.8	C	26.9	D

1 pc/mi/ln=Passenger Cars per Mile per Lane
2 LOS=Level of Service
3 Results for Merge areas downstream of on ramps based on freeway segment analysis methodology
**Field observations indicate that the EB on-ramp merge functions at LOS E/F in the AM peak hour due to operational friction that is caused by the atypical geometric configuration at this merge point (2 lane on-ramp merging with 3 upstream lanes into a 4-lane mainline section downstream).*

Local Roadway Intersection Analysis

Existing overall peak hour traffic operations at intersections within the Project's "Primary" Study Area are summarized in Table 4.8.6 and on Graphic 4.8-2. A more detailed summary of peak hour operations, by traffic movement, is provided in Table C.1.1 of Appendix C, Traffic Operations Study. The I-90 east and westbound off-ramps connect directly to Cambridge Street. Drivers exiting I-90 destined for Cambridge, Memorial Drive or SFR eastbound or westbound, use off-ramps that intersect Cambridge Street at Soldiers Field (adjacent to the Double Tree Hotel). The concentration of high volumes from the I-90 off-ramps, Cambridge Street and SFR ramps results in poor operations and long queues at this intersection during both peak periods, particularly on the I-90 off-ramp approach.



Graphic 4.8.2: Existing overall peak hour traffic operations at intersections within the Project's "Primary" Study Area (signalized intersections)

As shown in Table 4.8.6, operations at the intersection of Cambridge Street (& I-90 off-ramps) at SFR were "calculated" to be LOS F with a volume-to-capacity (v/c) ratio of 1.28 in the AM peak. In the afternoon peak hour, the intersection function at LOS F with at v/c ratio of 1.52. Additionally, field observations at this location in the AM peak indicate that the vehicular queues on the I-90 eastbound off-ramp are routinely in excess of 1,000 feet with vehicles queued in two lanes (approximately 80 vehicles in total). The queuing is indicative of LOS F operations, but with a v/c ratio that is far higher than the calculated 1.28.

Other key locations in the vicinity of the Allston Interchange through which drivers travel in order to gain access or egress to the I-90 ramps are:

- Cambridge Street/North Harvard Street (AM = LOS B; PM = LOS D)
- River Street/Memorial Drive (AM = LOS F; PM = LOS E)
- Western Avenue/SFR (AM = LOS E; PM = LOS E)
- Cambridge Street/Harvard Avenue (AM = LOS F; PM = LOS E)

The results of the existing peak hour queuing analysis at the primary Study Area intersections are summarized in Table C.1.2 in Appendix C. The queuing analysis is based on results from SimTraffic simulations and is presented on a per lane basis along with the existing lane storage capacities. SimTraffic is a model used to simulate a wide variety of traffic controls. Each vehicle in the traffic system is individually tracked through the model and comprehensive operational measures of effectiveness are collected on every vehicle during regular intervals of the simulation. Copies of the existing intersection analysis calculation sheets (LOS and queuing) are in Appendix C.

Table 4.8.6: Existing Intersection Traffic Operations Summary

		AM Peak Hour			PM Peak Hour		
	Location/Movement	**v/c[1]**	**Delay[2]**	**LOS[3]**	**v/c[1]**	**Delay[2]**	**LOS[3]**
	Signalized Intersections						
1	Harvard Ave./Cambridge St.	1.20	105	F	0.91	57	E
2	Cambridge St./Lincoln St.	0.78	17	B	0.96	24	C
3	North Harvard St./Cambridge St.	0.85	20	B	0.99	44	D
4	Cambridge St./Windom St.	1.05	142	F	0.86	21	C
5A	I-90 Off-Ramp & Cambridge St.	0.95	143	F	0.90	97	F
5B	SFR/Cambridge St.	1.28	108	F	1.52	179	F
6	Memorial Dr./River St.	1.28	108	F	0.99	76	E
7	North Harvard St./Western Ave.	0.65	35	C	0.58	28	C
8	Western Ave./Hague St/Batten Way	0.65	23	C	0.64	23	C
9	Western Ave./SFR	0.83	62	E	0.98	77	E
10	Western Ave./Memorial Dr.	1.08	79	E	1.05	67	E
11	North Harvard St./SFR EB Ramps	0.78	37	D	0.73	34	C
12	North Harvard St./SFR WB Ramps	0.84	50	D	0.91	76	E
13	J.F.K. Street/Memorial Drive	1.10	73	E	0.98	48	D
	Unsignalized Intersections						
14	Cambridge St./Linden St. NB R	0.73	21	C	0.73	20	C
15	Cambridge St./Sorrento St. SB R	0.02	14	B	0.03	13	B
16	Cambridge St./Seattle St. SB R	0.07	15	C	0.05	14	B
17	N. Harvard St./Spurr St. EB LR	0.26	12	B	0.62	28	D

[1] Volume to Capacity ratio | [2] Delay in sec/veh | [3] HCM 2000 Level of Service

4.8.1.6 Existing Safety Analysis Results

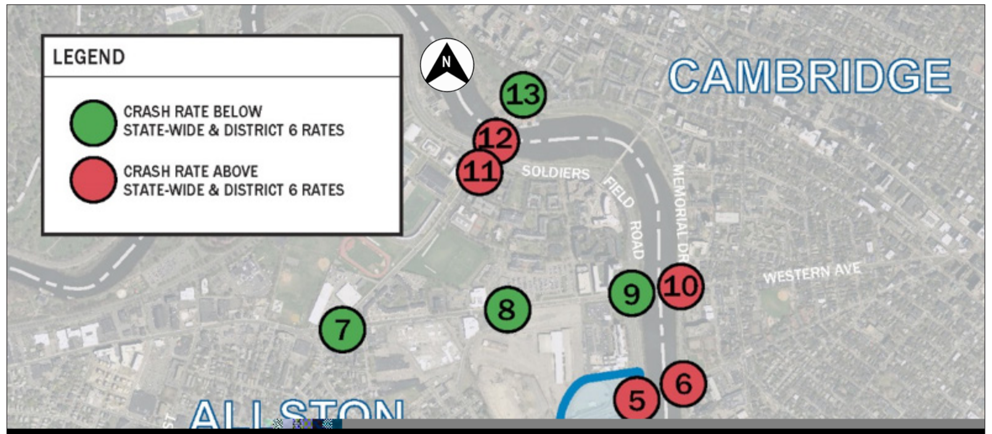
A summary of crash data within the Project's primary Traffic Study Area is provided in Table C.1.3 in Appendix C, Traffic Operations Study. The data is for the period of 2011 – 2014, the most recent four-year period available from MassDOT's crash record database. The source of the crash data for the intersections along the Cambridge Street corridor is a Road Safety Audit (RSA) performed by MassDOT for that corridor in March 2015. The crashes documented in the RSA are a combination of data from the MassDOT database and Boston Police Department (BPD) records. The RSA covered the period of January 2011 through June 2014. Crash data for the Cambridge Street corridor for the time period of June 2014 through December 2014 is from the MassDOT database.

Cambridge Street Corridor

The crash data indicates that there were 204 reported crashes in the Cambridge Street corridor (Harvard Avenue to Memorial Drive) between 2011 and 2014. Of those crashes, six involved pedestrians and 20 involved bicyclists. In addition, according to the RSA there were two pedestrian and three bicycle crashes in the first half of 2014, and a fatal pedestrian crash which occurred on the I-90 on-ramp from Cambridge Street eastbound on July 16, 2014.

The RSA was undertaken by MassDOT and the City of Boston to address concerns about pedestrian and bicycle conflicts with vehicle traveling at high speeds in the corridor, and in particular, at the junctions with the I-90 ramps (the on-ramp from Cambridge Street eastbound and the off-ramp to Cambridge Street westbound). The data in Table C.1.3 supports these agencies' concerns. As a result of the RSA, the City of Boston implemented a pavement marking and signage improvement plan in November 2014 that established an in-street buffered bicycle lane on Cambridge Street eastbound between Linden Street and SFR. In the westbound direction of Cambridge Street, a separated bicycle facility was installed between SFR and Windom Street, and between North Harvard Street and the Cambridge Street Bridge over I-90. Between Windom Street and North Harvard Street, and from the Cambridge Street overpass to Harvard Avenue, a bike lane was installed. The approximate limits of the buffered bike lanes are shown on Figures 4.7-1 and 4.7-2 (Existing Pedestrian and Bicycle Facilities).

It is also important to note that, notwithstanding the number of crashes in the corridor, only two intersections have crash rates in excess of the MassDOT statewide and MassDOT District 6 average crash rates. Those intersections are Cambridge Street at SFR/I-90 ramps in Boston (crash rate = 1.10), and Memorial Drive at River Street in Cambridge, which has a crash rate of 1.07 crashes per million entering vehicles. The statewide average rate for signalized intersections is 0.77, and the District 6 rate is 0.70. Graphic 4.8-3 provides the Existing Safety Summary, which shows which of the primary traffic Study Area intersections are above the statewide or MassDOT District 6 crash rates.


LEGEND
CRASH RATE BELOW STATE-WIDE & DISTRICT 6 RATES
CRASH RATE ABOVE STATE-WIDE & DISTRICT 6 RATES
N
CAMBRIDGE
ALLSTON
SOLDIERS FIELD ROAD
MEMORIAL DR
WESTERN AVE
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12
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10
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8
7
6
5

Graphic 4.8.3: Existing Safety Summary

Other Study Intersections

Crash data for the Western Avenue corridor and the North Harvard Street/JFK Street corridor indicate that there are several intersections that exceed the statewide and District 6 average crash rates. In the Western Avenue corridor, the intersection of Memorial Drive and Western Avenue in Cambridge exceeds the District 6 average rates. Along the North Harvard Street/JFK Street corridor, the intersections of North Harvard Street with the SFR eastbound and westbound on-/off-ramps exceed the average rates. The crash data at the North Harvard Street/SFR ramp intersections are from the period prior to the start of the Lars Anderson Bridge reconstruction project.

The data for these two corridors also indicates that the crashes primarily involve motor vehicles only, and there are less pedestrian and bicycle crashes in these areas than along the Cambridge Street corridor. Along Western Avenue there were two pedestrian and three bicycle crashes reported between 2011 and 2014. Along the North Harvard Street/JFK Street corridor there were zero pedestrian and five bicycle crashes reported during the study time period.

I-90 Mainline

Table C.1.3 of Appendix C also provides a summary of crashes that were reported on the I-90 mainline between the Everett Street overpass west of the interchange, to the BU Bridge/Commonwealth Avenue overpass east of the interchange. These limits encompass the existing I-90 viaduct as well as the portion of the highway that is influenced by the exchange of volumes at the on- and off-ramps at the Allston Interchange.

The MassDOT mainline data indicates that a total of 220 crashes were reported on this segment of I-90 during the four-year study period, which translates to approximately 55 crashes per year. In 2014, the last year of the study period, 72 crashes were reported, which could indicate an upward trend in crashes as traffic volumes increase with the improving economy. The most frequent type of crash reported on I-90 was rear-end crashes (88 crashes; 40%), which is indicative of the type of crash associate with congested conditions in the vicinity of the interchange; e.g., traffic back-ups at the off-ramps or at the mainline toll plaza which was in place during the study period.

Copies of the original MassDOT crash data and the Crash Rate calculation sheets are provided Appendix C, Traffic Operations Study. A copy of the MassDOT March 2015 final Cambridge Street RSA is also provided in Appendix C.

I-90 Viaduct (Throat Area). MassDOT also conducted supplementary safety analysis specific to the Throat Area segment of I-90. Crash data for the years 2013 through 2015 were used for this safety evaluation, and that data is summarized in Table 4.8.7.

As noted in the table, the analysis period data includes a fatal crash in the westbound direction of I-90, which occurred on March 27, 2015. In this incident, a secondary crash occurred when two vehicles pulled over into the right travel lane to exchange information about their sideswipe crash, when they were rear-ended by a third vehicle resulting in the fatality. In broader terms, the crash analysis indicates that the portion of I-90 on the viaduct has an overall crash rate that is nearly double the statewide rate for similar highway facilities: 1.08 crashes per million vehicle miles travelled (MVMT) as compared to 0.58 crashes per MVMT (86% greater than the statewide rate). If the westbound direction of I-90 is considered independently, the crash rate was found to be even higher: 1.30 crashes per MVMT, or a rate approximately 125% above the statewide rate.

These significantly higher than average rates are indicative of existing safety problems could be related to factors such as geometry (cross-section, horizontal alignment, etc.) or traffic operations (lane changing because of the nearby Allston ramps). These are the type of issues that MassDOT has taken into consideration in developing alternatives for the Throat Area.

Table 4.8.7: I-90 Viaduct Crash Summary (2013 through 2015)

	Eastbound				Westbound				EB + WB
Year	Fatal	Injury	PDO	Total	Fatal	Injury	PDO	Total	Total
2013	0	2	3	5	0	3	15	18	**23**
2014	0	0	6	6	0	1	11	12	**18**
2015	0	0	18	18	1	2	19	22	**40**
Average (crashes/ year)	*0*	*0.67*	*9*	*10*	*0.33*	*2*	*15*	*17*	***27***
Crash Rate (MVMT)[1]				0.77				1.30	**1.08**
Statewide Crash Rate (MVMT)[2]				0.58				0.58	**0.58**

[1] *Highway Crash Rate is expressed as Crashes per Million of Vehicle Miles Traveled (MVMT)*
[2] *Statewide Crash Rate for Urban Interstate Highways*

4.9 Rail/Transit

The following sections provide an overview of the existing regional and local rail and transit services operating through, or in general proximity to, the Project Area, including a description of rail and transit characteristics of the rail yard.

4.9.1 Rail Yard

The rail yard is located adjacent to the Worcester Main Line, bounded by I-90 to the north and the main line track to the south. Since the 19th century, this site served CSXT and legacy railroads as a major freight rail yard and intermodal terminal in Boston. In 2000 and 2003, Harvard University made two purchases known respectively as Allston Landing North and Allston Landing South from the Massachusetts Turnpike Authority (now MassDOT). These purchases included BPY and were made subject to CSXT's rights in BPY, which Harvard has also reached an agreement to purchase, (some of which is now complete.)

The rail yard currently has six layover tracks, adjacent to the Worcester Main Line ROW. The rail yard ties to the Worcester Main Line at both the west and east ends of the yard, and to the single-track GJR at the east end of the yard. The west side of the existing rail yard ties to the Worcester Main Line just west of the Cambridge Street Bridge, and the east side of the existing rail yard ties to the Worcester Main Line through crossovers located in the Throat Area.

The rail yard property, owned by Harvard University Beacon Yards, LLC., is the subject of an easement held by the MBTA and an option held by MassDOT. MassDOT and the MBTA also have additional rights in the area under prior agreements with CSXT and its predecessors. See Figure 4.2-2.

- **The MBTA Easement:** This approximately 135-foot-wide by 3,350-foot-long easement area allows the MBTA to maintain a double-track MBTA main line and construct a four-track layover yard on the MBTA railroad easement. Up to 12 train sets could be accommodated on the MBTA easement area.
- **The EOTC Option:** This approximately 132-foot-wide by 3,100-foot-long area, immediately north of the MBTA Easement area, gives MassDOT an option to acquire an easement for the purpose of developing an intermodal facility for freight to, from, or through the Port of Boston.

The GJR is a single-track branch from the Worcester Main Line that leads through Cambridge, the MIT campus, and to the north of Kendall Square to connect to the MBTA Commuter Rail Maintenance Facility and the Fitchburg Line, approximately two miles from the rail yard. The GJR runs beneath the I-90 viaduct, over SFR on a two-span bridge, and over the Charles River on a multi-span bridge that passes beneath the BU Bridge. To access the GJR from the Worcester Main Line, the current track configuration requires trains to enter the rail yard. In the Throat Area, the single-track GJR connects to the Worcester Main Line through crossover tracks from the rail yard.

4.9.2 Worcester Main Line

The two-track Worcester Main Line runs through the southern part of the Project Area. From west to east, the Worcester Main Line is located south of I-90, passes under the Cambridge Street Bridge, continues straight between the rail yard and developed land to the south, and curves south to continue underneath the I-90 viaduct through the Throat Area.

A rail spur to Houghton Chemical Corporation branches off the Worcester Main Line and the GJR in the Throat Area, runs north between I-90 and SFR, and terminates in the northeast portion of the Project Area. The rail spur will cease operation by spring 2019.

MBTA Commuter Rail Service

The 44-mile Framingham/Worcester Line commuter rail service runs through the Project Area on the Worcester Main Line from South Station to Worcester via the Metrowest region, serving a total of 17 stations. On a typical weekday, there are 8,474 total inbound boardings on the Framingham/Worcester Line.[1]

According to the MBTA's *Service Delivery Policy,* the minimum weekday frequency of service for commuter rail is three trips in the peak direction (eastbound toward the City of Boston) during the morning peak period, four trips in the peak direction during the afternoon peak period, and at least one trip in each direction every three hours during all other periods.[2] The MBTA provides more service on the Framingham/Worcester Line than on any other individual branch line of the commuter rail system. The Framingham/Worcester Line weekday service frequency is 27 daily trips in each direction.[3] During the morning peak, there are 11 trips in the peak direction, including seven trips starting from Worcester and four trips starting from Framingham. Three peak period trips from Worcester currently run express inbound between West Natick Station or Natick Center Station and Boston's Yawkey Station, and one peak period trip runs express directly from Worcester Station to Yawkey Station. During the evening peak, there are ten outbound trips, including seven trips to Worcester and three trips terminating in Framingham. Four peak period trips to Worcester currently run express from Yawkey Station to either Natick Center Station or West Natick Station.

The minimum weekday span of service for commuter rail is 7:00 a.m. to 10:00 p.m. per the *MBTA's Service Delivery Policy*.[4] On weekdays, Framingham/Worcester Line trains depart from Worcester as early as 4:45 a.m., and arrive at Worcester as late as 1:00 a.m.[5]

The most recent commuter rail ridership data published by the MBTA in the 2014 *Ridership and Service Statistics* report indicates that approximately 16,000 passengers (8,000 inbound and 8,000 outbound) board the Framingham/Worcester line on a typical weekday.

Beyond the east end of BPY, the single-track GJR provides the only rail connection east of Worcester between Boston's South Side commuter rail system (comprising services that originate/terminate at South Station) and Boston's North Side commuter rail system (comprising lines that originate/terminate at North Station). The GJR runs from BPY, beneath the I-90 viaduct, over SFR and the Charles River via a railroad bridge located beneath the BU Bridge, into Cambridge. The GJR continues through Kendall Square, connecting to the MBTA's Commuter Rail Maintenance Facility and Fitchburg Line, approximately two miles away. The MBTA uses the GJR for non-revenue moves to transfer equipment between the commuter rail system's North Side and South Side.

A new MBTA commuter rail station, Boston Landing, opened in May 2017. The station is located approximately one mile west of the proposed West Station site. Boston Landing consists of a center island platform, two commuter rail main line tracks and a runaround track for freight operations.

Amtrak Intercity Rail Service

Amtrak operates its Lake Shore Limited service over the MBTA's Worcester Main Line from South Station in Boston to Chicago, Illinois via Albany, New York. The Lake Shore Limited runs one daily round trip to/from South Station during the off-peak periods. Lake Shore Limited trains depart South Station at 12:50 p.m. and arrive at South Station at 8:01 p.m. daily.[6] In FY 2015, there were a total of 356,898 boardings on the Lake Shore Limited service.[7] Amtrak uses the GJR tracks to transfer equipment between the Downeaster to the north and the south side.

The on-time performance for the Lake Shore Limited service was approximately 61% for the period between February 2016 and February 2017.[8] Historically, the primary causes of system delays for the Lake Shore Limited service are freight and commuter train interference, passenger connectivity delays and track/signal issues.

CSXT Freight Service

CSXT operates regular freight service in the vicinity of the Project Area. A daily roundtrip train provides service to and from the New England Produce Center in Chelsea via the Worcester Main Line and the GJR. CSXT also operates freight service during off-peak periods between its yard in Framingham to its customer Houghton Chemical, located northeast of the Project Area. Per Houghton Chemical representatives, CSXT delivers materials to their plant approximately one to two times a week on a random schedule. An agreement between Houghton Chemical, Harvard University and CSXT will lead to a discontinuation of rail services and the associated spur track to the Houghton Chemical site before this Project breaks ground.

4.9.3 MBTA Trolley/Subway Service

Figure 4.9-1 illustrates the various MBTA transit services in the vicinity of the Project Area. Copies of the MBTA ridership data are provided in Appendix C. The MBTA Green Line B Branch provides trolley/subway service between Lechmere Station and Boston College via Government Center. The B Branch operates on seven-minute headways during the weekday morning peak period and ten-minute headways during the weekday evening peak period. There are a total of six inbound and outbound MBTA Green Line B Branch stops located in an approximate half-mile radius of the proposed West Station. Those stops are listed in Table 4.9.1 along with daily ridership data for each station. The most recent passenger count data available for the Green Line service published by the MBTA in *Ridership and Service Statistics 14th Edition*, 2014 (the MBTA "Blue Book") indicates that the Green B Branch serves approximately 26,000 passengers per day, with the Harvard Avenue station in Allston having the most boardings (approximately 3,600 per day).

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[1] Massachusetts Bay Transportation Authority. *Ridership and Service Statistics.* FY 2013 Annual Average. 2014.

[2] Massachusetts Bay Transportation Authority. *MBTA Service Delivery Policy.* 2017 Update. January 23, 2017.

[3] Massachusetts Bay Transportation Authority. *Commuter Rail Maps and Schedules*. Train Schedule Effective November 21, 2016. Accessed March 21, 2017. http://www.mbta.com/schedules_and_maps/rail/.

[4] Massachusetts Bay Transportation Authority. *MBTA Service Delivery Policy.* 2017 Update. January 23, 2017.

[5] Massachusetts Bay Transportation Authority. *Commuter Rail Maps and Schedules.* Train Schedule Effective November 21, 2016. Accessed March 21, 2017. http://www.mbta.com/schedules_and_maps/rail

[6] Amtrak. Lake Shore Limited Schedule. *Train Schedule Effective* April 24, 2016. Accessed March 21, 2017. https://www.amtrak.com/train-schedules-timetables

[7] Amtrak. Amtrak FY15 *Ridership & Revenue.* Accessed March 21, 2017. http://media.amtrak.com/fact-sheets

[8] Amtrak. Lake Shore Limited Endpoint On-Time Performance. www.amtrak.com. Viewed on March 21, 2017.

Table 4.9.1: Existing Boardings at MBTA Green Line B Branch Stations

Commonwealth AveGreen Line Stations	Daily PassengerBoardings[1]
BU West	704
St. Paul Street	1,296
Pleasant Street	1,167
Babcock Street	1,387
Packards Corner	2,654
Harvard Avenue	3,602
Total	**10,810**

[1] Typical weekday bi-directional (inbound and outbound) boarding volumes observed in 2010 or 2011 taken from Ridership and Service Statistics, 14th Edition, 2014, prepared by the Massachusetts Bay Transportation Authority as revised July 2014.

4.9.4 MBTA Bus Service

The MBTA offers several bus routes with stops within an approximate half-mile radius of the proposed West Station. These bus routes operate with headways ranging from 5 minutes to 30 minutes during weekday peak periods depending on the route. The routes are:

- **Route 57/Route 57A:** Bus Route 57 operates between Watertown Yard in Watertown to Kenmore Station in Boston via Commonwealth Avenue. With over 10,000 boardings per day, this route in among the ten highest ridership routes on the MBTA's bus system.
- **Route 64:** Bus Route 64 operates between Oak Square in Brighton to either Kendall Square/MIT or University Park in Cambridge via Cambridge Street.
- **Route 66:** Bus Route 66 operates between Harvard Square Station in Cambridge to Dudley Square Station in Roxbury via Cambridge Street. There were 13,933 total boardings on a typical weekday, making the Route 66 the third highest ridership route on the MBTA's bus system.
- **Route 70/Route 70A:** Route 70 operates between Cedarwood, Market Place Drive, or Central Square in Waltham and University Park in Cambridge via Western Avenue and River Street.
- **Route 86:** Route 86 operates between Sullivan Square Orange Line Station in Charlestown and the Reservoir Green Line Station (D Branch) on Chestnut Hill Avenue in Brighton, via Harvard Square (Red Line).

The most recent passenger count data available for the area bus routes, published by the MBTA in *Ridership and Service Statistics 14th Edition*, 2014 (the MBTA "Blue Book"), is presented in Table 4.9-2 along with peak period headway data for each route.

Table 4.9.2: Existing MBTA Bus Routes in the Vicinity of the Project Area

Bus Route	Daily Passenger Boardings[1]			Peak Period Headway[2]	Approx. Hours of Operation[3]
	Inbound	Outbound	Total		
57	5,012	5,082	10,094	10 – 13 minutes	4:30 AM – 3:00 AM
64	1,140	837	1,977	15 – 30 minutes	5:30 AM – 1:15 AM
66	6,716	7,217	13,933	10 minutes or less	5:00 AM – 3:15 AM
70/70A	2,597	2,658	5,255	5 – 30 minutes[4]	4:45 AM – 1:15 AM
86	2,591	3,027	5,618	8 – 19 minutes	5:00 AM – 1:00 AM

[1] Typical Fall 2012 weekday boarding volumes taken from Ridership and Service Statistics, 14th Edition, 2014, prepared by the Massachusetts Bay Transportation Authority as revised July 2014.

[2] Weekday headways during typical peak commuting periods (7am-9am, 4pm-6pm) based on terminal departure times published by the MBTA.

[3] Hours of operation reported are rounded to the nearest 15 minutes of actual operating time.

[4] Headways presented are for Route 70. The Route 70A bus route operates with longer headways ranging from 25 to 60 minutes during peak weekday commuting periods.

4.9.5 Private Bus Services

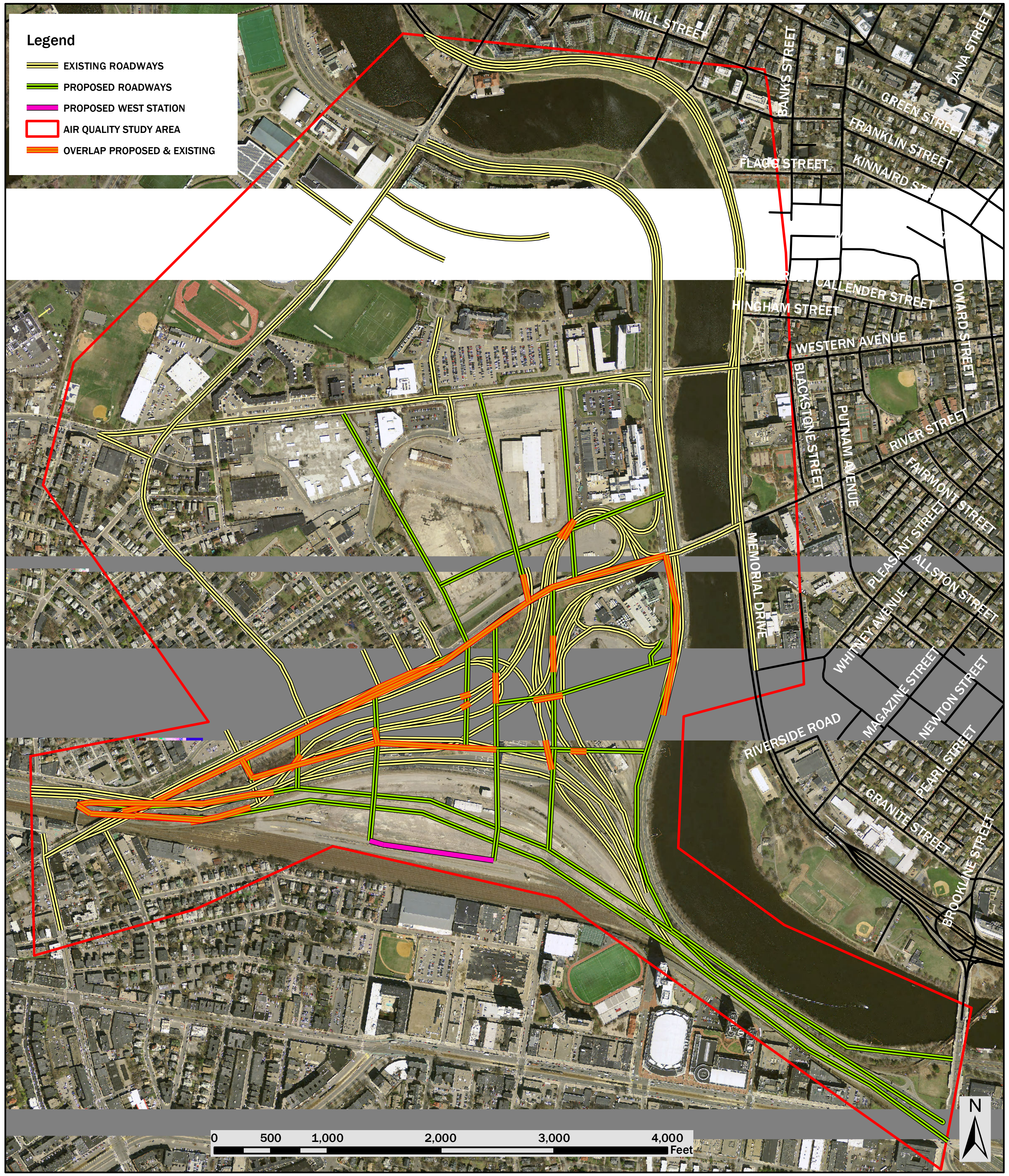
Two privately-operated bus services have routes in proximity of the Project Area. The services are:

- **BU Shuttle:** The BU Shuttle operates between the BU Medical Campus and the Charles River Campus. The nearest shuttle stop to the project site is located at 33 Harry Agganis Way, across from Nickerson Field, approximately 0.2 miles from the Project Area.
- **Harvard University Shuttle:** Harvard University's Allston Campus Express operates between Lamont Library in Cambridge and the Harvard University Allston Campus. The shuttle makes three stops on Western Avenue, at 1 Western Avenue, at Harvard's Innovation Lab and at Barry's Corner. These three shuttle stops are all located at a straight-line distance of approximately 0.6 to 0.7 miles from the Project Area.

4.10 Air Quality/Greenhouse Gas

This section describes the existing air quality conditions in the Project Area Air Quality Study Area, as shown on Graphic 4.10-1, for use in comparing air quality trends and predicted air quality impacts of the Project. The assessment of the existing air quality based on review of data for existing and historical air quality conditions, and projections based on local traffic and rail activities in the Study Area. Appendix F, Air Quality Analyses, provides detailed information on methodology, modeling and analyses.

This section also discusses the existing transportation-related greenhouse gas (GHG) emissions. The primary GHG discussed is carbon dioxide (CO_2). While there are other GHGs, CO_2 is the predominant contributor to global warming, and emissions can be calculated for CO_2 with readily accessible data. Appendix G, GHG Analyses, provides detailed information on methodology, modeling and analyses.


Legend
EXISTING ROADWAYS
PROPOSED ROADWAYS
PROPOSED WEST STATION
AIR QUALITY STUDY AREA
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BANKS STREET
DANA STREET
GREEN STREET
FRANKLIN STREET
FLAGG STREET
KINNAIRD ST
CALLENDER STREET
HINGHAM STREET
HOWARD STREET
WESTERN AVENUE
BLACKSTONE STREET
PUTNAM AVENUE
RIVER STREET
FAIRMONT STREET
MEMORIAL DRIVE
PLEASANT STREET
ALLSTON STREET
WHITNEY AVENUE
MAGAZINE STREET
NEWTON STREET
RIVERSIDE ROAD
PEARL STREET
GRANITE STREET
BROOKLINE STREET
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Graphic 4.10-1: Air Quality Study Area

Table 4.10.1: Massachusetts & National Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS (µg/m³)
Sulfur Dioxide (SO^2)	1-hour[P] 3-hour[S] Annual[P] (Arithmetic Mean)	196[a] 1,300[b] 80
Carbon Monoxide (CO)	1-hour[P] 8-hour[P]	40,000[b] 10,000[b]
Nitrogen Dioxide (NO_2)	1-hour[P] Annual[P/S] (Arithmetic Mean)	188[c] 100
Coarse Particulate Matter (PM_{10})	24-hour[P/S]	150
Fine Particulate Matter ($PM_{2.5}$)	24-hour[P/S] Annual[P] (Arithmetic Mean) Annual[S] (Arithmetic Mean)	35[d] 12[e,f] 15
Ozone (O_3)	8-hour[P/S]	137[g]
Lead (Pb)	Rolling 3-Month Avg.[P/S]	0.15

[P] = primary standard | [S] = secondary standard.

[a] 99th %ile 1-hour concentrations in a year (average over three years).

[b] One exceedance per year is allowed.

[c] 98th %ile 1-hour concentrations in a year (average over three years).

[d] 98th %ile 24-hour concentrations in a year (average over three years).

[e] Three-year average of annual arithmetic means.

[f] As of January 15, 2013, the U.S. EPA lowered the $PM_{2.5}$ annual primary standard from 15 ug/m³ to 12 ug/m³.

[g] Three-year average of the annual 4th-highest daily maximum 8-hour ozone concentration must not exceed 0.070 ppm (137 ug/m³) (effective December 28, 2015) and the annual PM_{10} standard was revoked in 2006.

4.10.1 Applicable Air Quality Regulations

Under the authority of the Clean Air Act (CAA), as amended, U.S. EPA established a set of National Ambient Air Quality Standards (NAAQS) for various 'criteria' air pollutants. These standards are intended to protect the public health and welfare. Primary NAAQS are established at levels intended to protect public health, including sensitive population groups, with an adequate margin of safety. Secondary NAAQS are set at levels designed to protect the public by accounting for the effects of air pollution on vegetation, soil, materials, and other aspects of the general welfare. Currently, there are NAAQS for seven criteria pollutants: ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), coarse and fine particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb). States can develop ambient standards provided that they are at least as stringent as the federal standards. The NAAQS are summarized in Table 4.10-1. The Massachusetts ambient air quality standards (MAAQS) are identical to the NAAQS. The CAA mandated that the U.S. EPA designate geographic regions in which measured ambient concentrations of air pollutants have exceeded the NAAQS as nonattainment areas[9]. Areas of the country that have measured pollutant concentrations that are less than the NAAQS are designated attainment areas. Areas that have attained the standards after a period of nonattainment and that have plans in place to reduce emissions are classified as maintenance areas.

Table 4.10.2: Summary Of Representative MassDEP Air Monitoring Data for the I-90 Allston Interstate Improvement Project and the National Ambient Air Quality Standards (NAAQS)

Pollutant	Monitor Location	Averaging Period	2013	2014	2015	Existing Background Level	NAAQS	Percent of NAAQS
Carbon Monoxide (CO)	Kenmore Square & Harrison Avenue	One-Hour	1,489	1,489	1,559	1,559 (1.4 ppm)	40,000	3.9%
		Eight-Hour	1,031	1,031	1,031	1,031 (0.9 ppm)	10,000	1.0%
Nitrogen Dioxide (NO_2)	Kenmore Square	One-Hour	90.3	92.2	105.3	95.9	188	51.0%
		Annual	33.4	32.3	32.5	33.4	100	33.4%
Ozone (O_3)	Kenmore Square	Eight-Hour	116	106	110	110	137	80.3%
Lead (Pb)	Harrison Avenue	3-Month Average	0.007	0.014	0.016	0.016	0.15	10.6%
Fine Particulate Matter ($PM_{2.5}$)	Kenmore Square	24-Hour	18.0	14.6	14.5	15.7	35	44.9%
		Annual	8.0	6.0	6.5	6.8	12	56.7%
Coarse Particulate Matter (PM_{10})	Kenmore Square	24-Hour	50	53	30	53	150	35.3%
Sulfur Dioxide (SO_2)	Kenmore Square	One-Hour	31.4	25.4	14.4	23.7	196	12.1%

The Project is in Suffolk County, which is part of the Boston-Lawrence-Worcester Eastern Massachusetts Non-attainment Area. Massachusetts was designated as a Serious Non-attainment Area with respect to the 1997 8-hour ozone standard of 0.08 parts per million (ppm). However, all air quality monitors now show that Massachusetts meets the 1997 ozone standard statewide. U.S. EPA updated the 8-hour ozone standard to 0.075 ppm in 2008 and designated Massachusetts as Attainment Statewide except for Dukes County (Martha's Vineyard) in 2011. In December 2015, the U.S. EPA further reduced the 8-hour ozone standard to 0.070 ppm.

Massachusetts, through its State Implementation Plan (SIP), specifies target dates for achieving compliance with the NAAQS and identifies specific emission reduction goals for non-attainment or maintenance areas. The Project's emissions are not explicitly included in the modeling emissions inventory for the conformity analysis in a conforming Regional Transportation Plan (RTP) or a Transportation Improvement Program (TIP), therefore, preparation of a Project-level emissions inventory is required.

Massachusetts General Laws Chapter 61 through 63, together with the regulations contained in the Code of Massachusetts Regulations at 301 C.M.R. 11.01 through 11.17, is known as the Massachusetts Environmental Policy Act (MEPA). The air quality regulations are located at 301 CMR 11.03 (8). MEPA, which is administered by the Executive Office of Energy and Environmental Affairs (EOEEA), mandates that whenever a state agency is involved in a project, and the action by the state agency is likely to cause significant environmental impacts, the agency's proposed actions are subject to public review and comment. The agency is required to consider ways to minimize or mitigate those environmental impacts, including consideration of alternatives to the proposed action.

4.10.2 Summary of Representative Air Monitoring Data

MassDEP maintains a statewide network of monitoring stations that continuously measure pollutant concentrations in the ambient air. These stations provide data to assess compliance with the NAAQS and the MAAQS and to evaluate the effectiveness of pollution control strategies. Table 4.10-2 summarizes the MassDEP air monitoring data, for the most recent available, complete, three-year period (2013-2015), that are considered to be representative of the Project Area. The closest, most representative MassDEP monitors for NO_2, $PM_{2.5}$, PM_{10}, and SO_2 are located at Kenmore Square in Boston. The closest, most representative MassDEP monitors for O_3 and Pb are located at Dudley Square (Harrison Avenue) in Boston. The closest, most representative MassDEP monitors for CO was located at Kenmore Square, but that monitor was discontinued in January, 2015, so data from Dudley Square was assumed for 2015.

Table 4.10-2 shows that the existing air quality in the Project Area is generally much better than the NAAQS. The highest impacts relative to a NAAQS are for ozone.

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[9] Nonattainment area is an area considered to have air quality worse than the National Ambient Air Quality Standards as defined in the Clean Air Act Amendments of 1970 (P.L. 91-604, Sec. 109).

4.10.3 Criteria Pollutant Emissions Inventory

An emission inventory (mesoscale air quality analysis) was prepared by source, of the amount of air pollutants emitted into the atmosphere on an annual basis. Project-related emissions inventories for the air quality Study Area were prepared for VOCs, NO_x, SO_2), CO, and PM_{10} and $PM_{2.5}$. The sources include diesel locomotives, as well as moving and idling motor vehicles on roadways in the air quality Study Area. The U.S. EPA's Locomotives Exhaust Emission Standards were used to calculate the emission rates for the diesel locomotives. The U.S. EPA's Motor Vehicle Emission Simulator (MOVES) emission factor model was used to calculate motor vehicle emissions.

Table 4.10-3 presents the total emissions, in tons per year, from both motor vehicles and locomotives for the 2015 Existing Conditions.

Table 4.10.3: Motor Vehicles and Locomotives Emissions Summary for 2015 Existing Condtions

Emission Source	Volatile Organic Compounds (VOCs)	Nitrogen Oxides (NO_x)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)	Carbon Monoxide (CO)	Sulfur Dioxide (SO_2)
Moving Vehicles	9.59	41.20	0.67	0.59	420.81	1.16
Idling Vehicles	1.93	3.69	0.09	0.09	33.60	0.21
Loco-motives	1.26	16.90	0.50	0.49	5.03	0.014
Total Sources	**12.78**	**61.79**	**1.26**	**1.17**	**459.44**	**1.38**

tons/year

4.10.4 CO Hot Spot Analysis

A microscale air quality analysis (hotspot) for CO was conducted for the project air quality Study Area. An existing hotspot analysis was conducted at intersections that are projected to be affected by the reconfiguration of the interchange. U.S. EPA models were used to predict the maximum one-hour and eight-hour average CO concentrations at sensitive receptors. The analysis evaluated the four worst-case intersections for the 2015 Existing Conditions based on level of service (LOS) analysis and total traffic volume.

Table 4.10-4 presents the results of the CO Hot Spot analysis for Existing Conditions (2015) within the Project Area. For the four intersections modeled, all of the one-hour CO concentrations were well below the one-hour CO National and Massachusetts standard of 35 parts per million (ppm), and all of the eight-hour CO concentrations were below the corresponding eight-hour CO National and Massachusetts standard of 9 ppm.

Table 4.10.4: Maximum Predicted One-Hour and Eight-Hour Carbon Monoxide Concentrations (ppm) for 2015 Existing Conditions

Intersection and Description	Maximum One-Hour		Maximum Eight-Hour	
	AM	PM	AM	PM
Harvard Ave./Franklin St. & Cambridge St.	1.9	1.9	1.3	1.3
Cambridge St. & Lincoln St.	1.9	2.0	1.3	1.3
Cattle Drive Connector & Cambridge St.	NA	NA	NA	NA
Memorial Dr. & Western Ave.	1.9	2.1	1.3	1.4
North Harvard St./JFK St. & Memorial Dr.	2.1	2.3	1.4	1.5
NAAQS:	**35**	**35**	**9**	**9**

Notes: NA = Not available. New Intersection in the 2040 Build alternative.
The added one-hour average background CO concentration is 1.4 ppm for all five cases.
The added eight-hour average background CO concentration is 0.9 ppm for all five cases.

4.10.5 $PM_{2.5}$ Hotspot Analysis

A quantitative $PM_{2.5}$ hot spot analysis was prepared following U.S. EPA's November 2013 guidance.[10] The analysis focused only on the emissions from the diesel trains and the motor vehicles in the air quality Study Area. Modeling was performed to calculate 24-hour and annual impacts for the 2015 Existing Conditions. The results of the analyses were compared to the National and Massachusetts 24-hour and annual $PM_{2.5}$ standards.

Table 4.10-5 presents the results of the $PM_{2.5}$ Hot Spot analysis for Existing Conditions (2015) within the Project Area. The eighth highest modeled 24-hour $PM_{2.5}$ concentrations plus background concentrations were well below the 24-hour $PM_{2.5}$ National and Massachusetts standard of 35 micrograms per cubic meter (ug/m³), and all of the maximum annual $PM_{2.5}$ concentrations plus background concentrations were below the corresponding annual $PM_{2.5}$ National and Massachusetts standard of 12 ug/m³. Both the 24-hour and annual maximum concentrations occurred near the corner of Harry Agganis Way and Buick Street.

Table 4.10.5: Maximum Predicted 24-Hour And Annual $PM_{2.5}$ Concentrations For 2015 Existing Conditions

Averaging Period	Maximum Predicted Impact (ug/m³)	Background Concentration (ug/m³)	Total Impact (ug/m³)	NAAQS (ug/m³)
24-Hour	1.17	15.70	16.87	35
Annual	0.49	6.80	7.29	12

4.10.6 NO_2 Dispersion Modeling Analysis

An air dispersion analysis was performed to assess the potential nitrogen dioxide (NO_2) impacts for the Existing Conditions (2015). The analysis focused on the emissions from the passenger and freight diesel trains operating along the existing rail lines south of the I-90 viaduct and motor vehicles on roadways in the Study Area. The U.S. EPA's Locomotives Exhaust Emission Standards were used to determine the emission rates for the locomotives. The U.S. EPA's MOVES emission factors prepared for the emissions inventory analysis were used in this analysis along with background NO_2 levels from MassDEP- and AERMOD-predicted concentrations to estimate NO_2 impacts. Modeling was performed to calculate one-hour and annual impacts for the 2015 Existing Conditions. The results of the analyses were compared to the National and Massachusetts one-hour and annual NO_2 standards.

The eighth highest modeled one-hour NO_2 concentrations at each of the receptors analyzed for the 2015 Existing Conditions are presented in Table 4.10-6. The maximum modeled one-hour NO_2 concentration is 218.20 ug/m³ and includes a background concentration of 95.9 ug/m³. This maximum one-hour NO_2 concentration occurred on the south side of the rail line on Wadsworth Street. While there are exceedances of the one-hour NO_2 standard, the one-hour concentrations are lower for the 2040 No Build and Build analyses (See Section 5.10).

The maximum modeled annual NO_2 concentrations at each of the receptors analyzed for the 2015 Existing Conditions are also presented in Table 4.10-6. The maximum modeled annual NO_2 concentration is 46.29 ug/m³ and includes a background concentration of 43.10 ug/m³. This maximum annual concentration occurred on the south side of the rail line on Wadsworth Street. All of the modeled annual NO_2 concentrations at all of the receptors modeled for the 2015 Existing Conditions were well below the annual NO_2 National and Massachusetts standard of 100 ug/m³.

Table 4.10.6: Maximum Predicted One-Hour And Annual No_2 Concentrations For 2015 Existing Conditions

Averaging Period	Maximum Predicted Impact (ug/m³)	Background Concentration (ug/m³)	Total Impact (ug/m³)	NAAQS (ug/m³)
One-Hour	122.3	95.90	218.2	188
Annual	9.70	33.40	43.1	100

4.10.7 Greenhouse Gas

This section addresses GHG emissions generated for the Existing Conditions (2015). The Massachusetts EEA GHG Policy requires MassDOT to calculate and compare the GHG emissions for stationary sources (buildings) and mobile sources (transportation components) to a baseline case to determine GHG savings in the future condition with project improvements. The policy requires that the analysis focus mainly on the primary GHG, carbon dioxide (CO_2). While there are other GHGs, CO_2 is the predominant contributor to global warming, and emissions can be calculated for CO_2 with readily accessible data.[11] The GHG Policy also requires MassDOT to identify, evaluate and discuss other measures that could reduce GHG emissions and to quantify the impact of proposed mitigation in terms of energy savings and GHG emissions.

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[10] U.S. EPA, Transportation Conformity Guidance for Quantitative Hot-spot Analyses in $PM_{2.5}$ and PM_{10} Non-attainment and Maintenance Areas, EPA-420-B-15-084, November 2015.

[11] Massachusetts EEA, Revised Greenhouse Gas Emissions Policy and Protocol, May 5, 2010.

The CO_2 emissions inventory was developed for motor vehicles on affected roadways within the Project Study Area, and existing railroad locomotives operations. The motor vehicle-generated CO_2 emissions were developed using the same roadway network used for the criteria pollutant emissions inventory discussed in Section 4.10.3.

Table 4.10-7 presents the total emissions, in tons per year, from both motor vehicles and locomotives for the 2015 Existing Conditions.

Table 4.10-7: Motor Vehicles & Locomotives CO_2 Emissions Summary

Moving Vehicles	Idling Vehicles	Locomotives	Total Sources
58,332.16	9,732.03	1,531.36	69,595.55

tons/year

4.11 Noise and Vibration

This section presents the regulatory context of the noise and vibration evaluation for the Project, background on how noise and vibration conditions are described, a summary of noise and vibration-sensitive land uses, and existing conditions at representative receptors. Existing sources of noise and vibration in the Study Area have been identified and the conditions have been characterized based on the results of ambient noise and vibration monitoring and modeling. Noise and vibration criteria used to assess future operational conditions and construction activities are presented in the Environmental Consequences Section 5.11 with the results of the impact assessment and mitigation evaluation. The Noise and Vibration Analysis is provided in Appendix H.

4.11.1 Regulatory Context

Several federal, state and local regulations, policies and ordinances apply to the evaluation of potential noise and vibration effects of the Project. The Project includes potential modification to both highway and rail infrastructure, therefore, guidance from federal rail and highway agencies have been used to assess the existing noise and vibration conditions in the Study Area and guide the Project impact assessment.

4.11.1.1 Highway and Rail Noise and Vibration Regulations, Policy and Guidance

Highway Policy
FHWA regulation 23 CFR 772 describes the procedures required for highway noise studies to help protect the public health and welfare, to supply abatement criteria, and to establish the requirements for information to be given to local officials for use in the planning and design of highways that are funded or otherwise subject to FHWA approval. This federal regulation requires MassDOT to have a noise policy that implements the requirements of the regulation.

The MassDOT Type I and Type II Noise Abatement Policies and Procedures (effective July 13, 2011) apply to all highway construction projects that receive federal aid or are otherwise approved by the FHWA, such as the Project. A Type I project is defined as one that includes construction of a highway on new location, the physical alteration of an existing highway that results in substantial horizontal or vertical alterations, the addition of through-traffic lanes, the addition of auxiliary lanes, the addition or relocation of interchange lanes or ramps, restriping to add through-lane capacity, or substantial alterations to toll plaza, or rest stops. Substantial vertical alteration is defined as changes to a highway elevation that would expose line-of-sight between a receptor and the traffic noise sources. Substantial horizontal alteration is defined as relocating a highway so that the distance between the highway and the closest receptor is half that of the existing condition. If any portion of a project is determined to be a Type I project, then the entire Project Area is considered a Type I project.

A Type II project is a voluntary project that receives federal aid involving the construction of highway noise barriers on existing highways where there are no capacity improvements. MassDOT has a voluntary Type II Noise Abatement Program that is implemented in accordance with FHWA requirements and as state funding is available.

The Project meets the definition of a Type I highway project due to the introduction of new roadways and horizontal and vertical alterations. The Study Area generally extends from the Franklin Street footbridge west of the Cambridge Street bridge to the BU Bridge. Two potential Type II noise barriers on the westbound (north) side of I-90 between Franklin Street and Everett Street and between Everett Street and Market Street, which have been on the MassDOT Type II priority list since 1992, have been included in the noise study to evaluate the feasibility and reasonableness of mitigation. These Type II noise barriers have been included in the study since they are adjacent to the western project terminus and the Project may facilitate the potential construction of the Type II barriers.

Rail Policy
The FTA's *Noise and Vibration Impact Assessment* (dated May 2006) guidance manual describes the methods and criteria used to assess potential noise and vibration impacts for rail infrastructure improvement projects that are subject to review under NEPA. This guidance manual is also used to assess potential impacts of the Project in accordance with MEPA.

The FHWA highway noise regulation, MassDOT noise policy and FTA guidance manual require that potential noise impact be assessed, including both highway and rail sources. Therefore, cumulative noise conditions including both highway and rail sources are used to characterize the existing conditions. Information about the methodology and criteria used to evaluate noise and vibration from highway and rail sources is described in the Noise and Vibration Technical Report in Appendix H.

4.11.2 Noise and Vibration Background

This section presents background on noise and vibration including how noise and vibration are described and the typical range of noise and vibration levels that people experience.

4.11.2.1 Noise Descriptors

Noise is typically defined as unwanted or undesirable sound, where sound is characterized by small air pressure fluctuations above and below the atmospheric pressure. The basic parameters of environmental noise that affect human response are: (1) intensity or level; (2) frequency content, and; (3) variation with time.

The first parameter is determined by how greatly the sound pressure fluctuates above and below the atmospheric pressure, and is expressed on a compressed scale in units of decibels. By using this scale, the range of normally encountered sound can be expressed by values between zero and 120 decibels. On a relative basis, a three-decibel change in sound level generally represents a barely-noticeable change outside the laboratory, whereas a 10-decibel change in sound level will typically be perceived as a doubling (or halving) in the loudness of a sound. The frequency content of sound is related to the tone or pitch and is expressed based on the rate of the air pressure fluctuation in terms of cycles per second (called Hertz and abbreviated as Hz). The human ear can detect a wide range of frequencies from about 20 Hz to 17,000 Hz. However, because the sensitivity of human hearing varies with frequency, the A-weighting system is commonly used when measuring environmental noise to provide a single number descriptor that correlates with human subjective response. Sound levels measured using this weighting system are called "A-weighted" sound levels, and are expressed in decibel notation as "dBA." The A-weighted sound level is widely accepted by acousticians as a proper unit for describing environmental noise.

Because sound levels fluctuate from moment to moment, it is important to characterize the range of levels that exist over a period of time. This is commonly done by using the following sound level metrics:

- **Lmax** is the maximum instantaneous A-weighted sound level. The Lmax represents the highest sound level generated by a source.
- **Leq** is the energy-average sound level. The Leq is a single value that is equivalent in sound energy to the fluctuating levels over a period of time. Therefore, the Leq takes into account how loud events are during the period, how long they last, and how many times they occur. Leq is commonly used to describe environmental noise and relates well to human annoyance.
- **Ldn** is the day-night average sound level. The Ldn is a value that represents the sound level over a 24-hour period with a 10-dB penalty applied to sound that occurs between 10:00 PM and 7:00 AM when people are more sensitive to noise. Similar to Leq, it takes into account how loud events are, how long they last, how many times the occur and whether they occur at night.
- **Statistical sound levels such as L_{10}, L_{50}, L_{90}** describe the sound level which are exceeded for that percent of time during a given time period. For example, the L_{10} sound level represents the higher end of the range of sound levels since sound only exceeds that level 10% of the time. Conversely, the L_{90} sound level represents the lower end of the range of sound levels.

Many surveys have shown that Ldn and Leq correlate well with human annoyance, and therefore, these descriptors are widely used for environmental noise impact assessment.

4.11.2.2 Vibration Descriptors

Ground-borne vibration is the oscillatory motion of the ground about an equilibrium position that can be described in terms of displacement, velocity or acceleration. The vibration velocity in the low-frequency range (4 to 80 Hz) typically corresponds well to human sensitivity and is therefore used to evaluate ground-borne vibration from transit sources for human annoyance. Vibration velocity is typically characterized in terms of the "smoothed" root-mean-square (RMS) level in decibels (VdB), with a reference quantity of one micro-inch per second. VdB is used in place of dB to avoid confusing vibration decibels with sound decibels.

Graphic 4.11-1 illustrates typical ground-borne vibration levels for common sources as well as criteria for human and structural response to vibration. As shown, the range of interest is from approximately 50 to 100 VdB, from imperceptible background vibration to the threshold of damage. Although the approximate threshold of human vibration perception is 65 VdB, annoyance is usually not significant unless the vibration exceeds 70 VdB.

Ground-borne vibration is also evaluated for its potential to cause structural damage to buildings. Unlike human sensitivity to vibration, the sensitivity of buildings and structures to vibration correlates well to the "peak vibration velocity" (PPV) which is typically measured in inches per second (in/s).

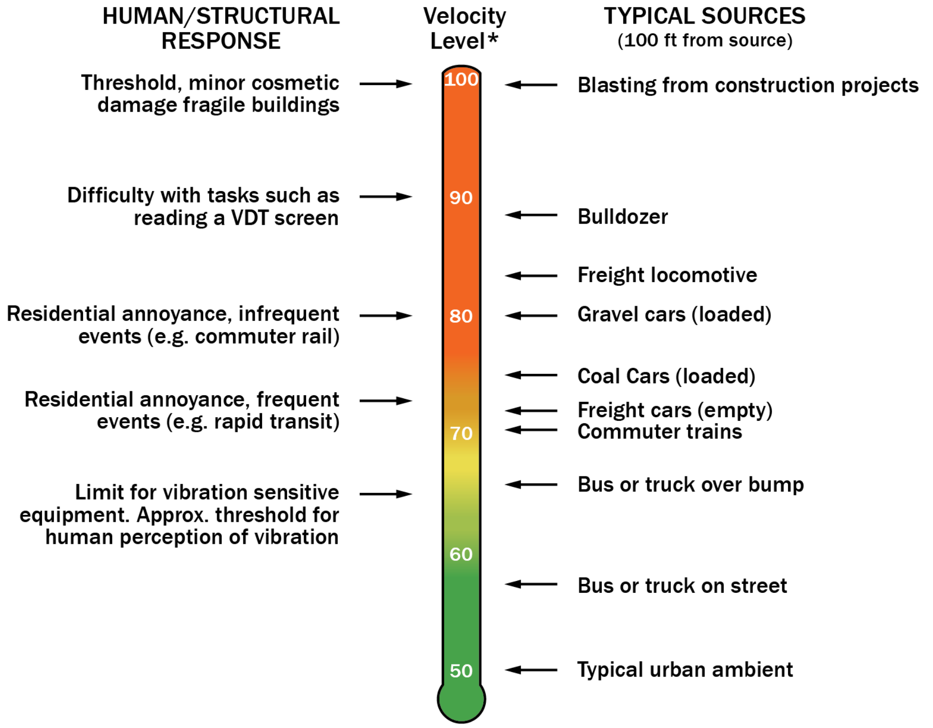
4.11.3 Existing Noise and Vibration Conditions

4.11.3.1 Methodology

Existing noise conditions have been determined at all identified receptors based on results of the FHWA's Traffic Noise Model and the FTA's rail noise model. Noise measurements have been conducted at representative locations throughout the Study Area to validate the highway and rail noise models and to ensure that the results of the model are accurate. The inputs to the noise models include the geometrical design of the roadway and track alignments, terrain throughout the Study Area, intervening objects such as buildings, retaining walls and parapet walls, and information about the receptors such as type of land use and number of dwelling units. Traffic and train operations data include volumes and speeds. Traffic noise depends on the percentage of vehicle types, since trucks and buses generate substantially more noise than do automobiles.

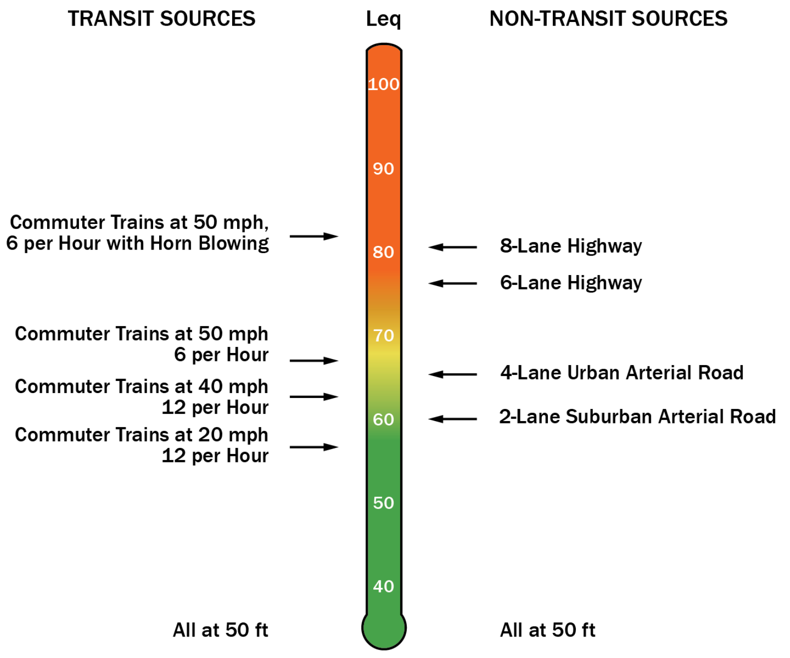
Train noise and vibration depend on the speed, consist, track condition and type of trains operating in the rail corridor. All existing trains operating in the rail corridor use diesel-electric locomotives to pull or push passenger coaches or freight rail cars. Since there are no active grade crossings in the Study Area, trains do not typically sound their horn other than when it may be needed under emergency conditions.

Existing train operations have been collected from the most recent MBTA Framingham/Worcester line commuter train schedule, Amtrak Lake Shore Limited schedule, and a 2012 CTPS study on freight train operations on the GJR line and observations of Houghton Chemical freight operations as described in Section 4.8.2. Graphic 4.11-2 shows typical A-weighted Leq noise levels at 50 feet for typical highways and train systems.


HUMAN/STRUCTURAL RESPONSE
Velocity Level*
TYPICAL SOURCES (100 ft from source)
Threshold, minor cosmetic damage fragile buildings
Difficulty with tasks such as reading a VDT screen
Residential annoyance, infrequent events (e.g. commuter rail)
Residential annoyance, frequent events (e.g. rapid transit)
Limit for vibration sensitive equipment. Approx. threshold for human perception of vibration
100
90
80
70
60
50
Blasting from construction projects
Bulldozer
Freight locomotive
Gravel cars (loaded)
Coal Cars (loaded)
Freight cars (empty)
Commuter trains
Bus or truck over bump
Bus or truck on street
Typical urban ambient

*RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second

Graphic 4.11-1: Typical Ground-Borne Vibration Levels. Source: FTA, 2006, color addition, MassDOT


TRANSIT SOURCES
Leq
NON-TRANSIT SOURCES
100
90
80
70
60
50
40
Commuter Trains at 50 mph, 6 per Hour with Horn Blowing
Commuter Trains at 50 mph 6 per Hour
Commuter Trains at 40 mph 12 per Hour
Commuter Trains at 20 mph 12 per Hour
All at 50 ft
8-Lane Highway
6-Lane Highway
4-Lane Urban Arterial Road
2-Lane Suburban Arterial Road
All at 50 ft

Graphic 4.11-2: Typical A-weighted Sound Levels. Source: FTA, 2006, color addition, MassDOT

4.11.3.2 Noise and Vibration-Sensitive Land Use

Noise- and vibration-sensitive land uses in the Study Area have been identified in accordance with FHWA Land Use Categories (A through F) and FTA Categories (1 to 3). These land uses include residences, hospitals, hotels, schools, libraries, museums, places of worship, medical facilities, theatres, recording studios, commercial businesses, parks, playgrounds, recreation areas and Section 4(f) sites. Receptors are primarily located at ground-level outdoor areas of frequent human use. For some institutional facilities, such as hospitals, schools, libraries, places of worship and recording studios, receptors may be located inside the building if there are no areas of frequent outdoor human use. If an upper-floor multi-family residence has exterior areas such as balconies or roof decks, then receptors will be located at these upper elevations. Commercial and industrial properties are evaluated only for construction-period activities unless there are outdoor areas of frequent human use. Vibration-sensitive land uses are similar to noise-sensitive land uses except that vibration, as it relates to human annoyance, is only evaluated inside buildings. It is not evaluated at parks. Vibration, as it relates to potential damage, is evaluated at all structures and buildings as part of the construction analysis.

In accordance with FHWA regulations, noise and vibration are assessed at existing sensitive uses and tracts of land that have already been permitted for sensitive use. If tracts of land are not permitted for sensitive use, they are not eligible for potential noise mitigation, but future noise conditions may be provided for informational and development planning purposes. Further information on the FHWA and FTA categories for noise and vibration receptors is provided in the Noise and Vibration Technical Report in Appendix H.

The Study Area for noise and the Study Area for vibration both extend from Project roads and tracks to include all receptors that may be impacted by the Project or will benefit from noise mitigation. The noise Study Area typically extends 300 to 500 feet from the nearest roads and train tracks. Receptors up to 1,500 feet from the Project in Cambridge have been included due to unique concerns about long-distance sound propagation. The Study Area for vibration includes receptors within approximately 100 feet from the train tracks where there is the potential for existing vibration levels to approach or exceed FTA vibration criteria.

In general, noise and vibration receptors throughout the Study Area include single-family and multi-family residences; BU facilities including classrooms, a concert hall, art gallery, dormitories and recreational facilities; Magazine Beach; Morse Elementary School and playground; hotels; Riverside Press Park; and a daycare center. Sections 4.11.3.4 to 4.11.3.13 summarize the existing noise and vibration conditions within each neighborhood.

4.11.3.3 Noise and Vibration Measurement Results

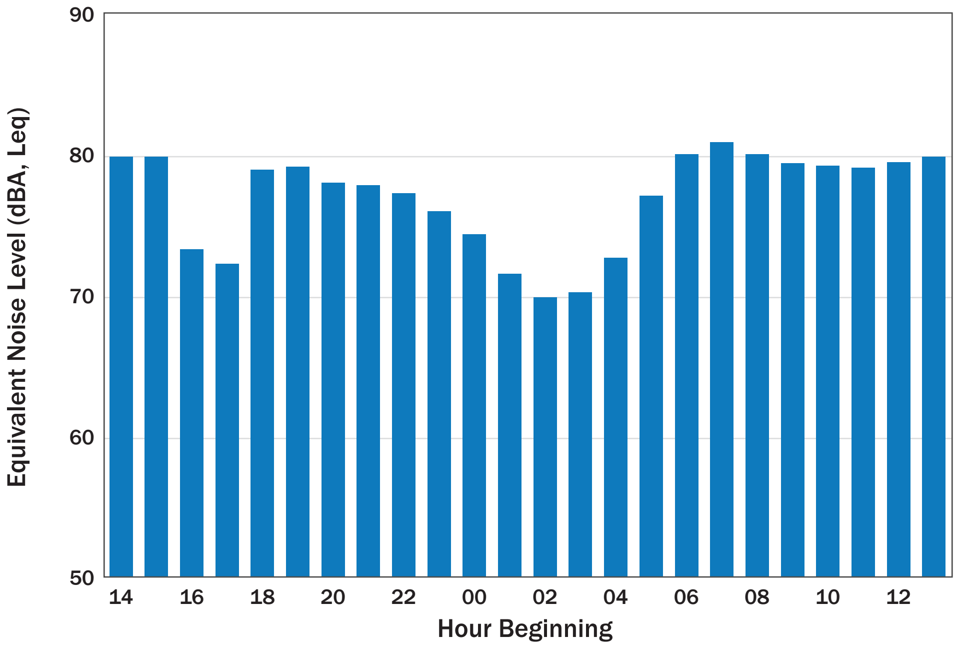
MassDOT conducted highway and train noise measurements from 2015 to 2017 including two long-term (24-hour) and 14 short-term (20-minute) sites in the Study Area, as shown in Graphic 4.11-6. Measurements were conducted following FHWA recommended methods and procedures. Traffic counts by vehicle classification were conducted and travel speeds were observed during short-term measurements. The traffic count data are used as input to the TNM to validate the model results.

Table 4.11-1 summarizes the existing ambient noise measurement results throughout the Study Area. Further information on the noise measurement results including the dates of the measurements and photographs of the sites are provided in the Noise and Vibration Technical Report in Appendix H.

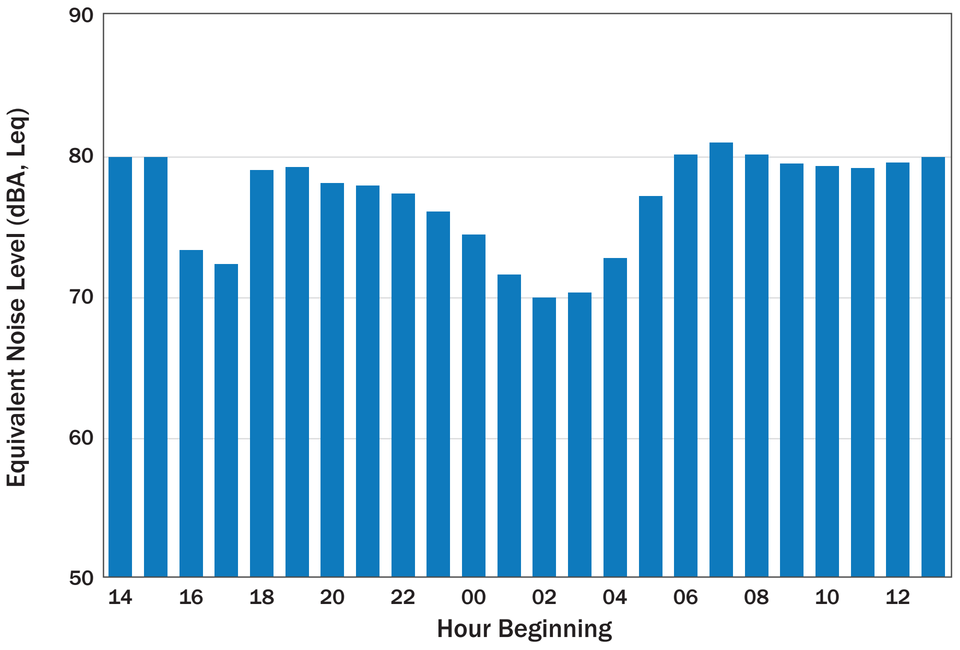
- Long-term noise measurement site LT-1 was conducted on Lincoln Street near Franklin Street approximately 40 feet from the westbound side of I-90 to understand the change in traffic noise levels throughout the day and determine the loudest-hour. As shown in Graphic 4.11-3, traffic noise is relatively constant during the daytime hours with the loudest-hour occurring during the morning peak travel period.
- Long-term noise measurement site LT-2 was conducted at 20 Wadsworth Street approximately 30 feet from the closest track. MBTA trains were the dominant noise source. See Graphic 4.11-4.
- Short-term noise measurements were conducted at three locations (ST-1, ST-2 and ST-3) representative of residential receptors on Lincoln Street along the westbound side of I-90. The dominant noise source at these locations was traffic on I-90.
- Measurements at ST-4 were conducted at 14 Wadsworth Street. The dominant sources of noise during this measurement included I-90, which is approximately 600 feet away, and traffic on local roads. MBTA trains did not pass by during the measurement.
- Measurements at ST-5 were conducted at a location representative of first-row residential receptors on Cambridge Street. I-90 is approximately 250 feet away on retained fill with limited line-of-sight to traffic. The predominant noise source was traffic on Cambridge Street.
- Measurements at ST-6 were conducted at the ground-level within BU near the 10 Buick Street dormitory. The predominant sources of noise included traffic on the I-90 viaduct and SFR. MBTA trains did not pass by during the measurements.
- Short-term measurements were conducted on the PDW Path at ST-7. The predominant noise source was traffic on SFR.
- Short-term measurements were conducted at two locations at Magazine Beach in Cambridge (ST-8 and ST-9) near the banks of the Charles River. The predominant noise sources at these locations include I-90 on viaduct, SFR, Memorial Drive and traffic on other roadways.

- Noise measurements were conducted at Magazine Street and Granite Street (ST-10) at residential receptors north of Memorial Drive. Although traffic from I-90 was occasionally audible, the predominant source of noise was traffic on Memorial Drive and Magazine Street.
- Measurements were conducted at 170-172 Magazine Street. (ST-11) at a location representative of ground-level residential receptors in Cambridgeport. The predominant sources of noise included traffic on local streets and Memorial Drive.
- Noise measurements were conducted at the Riverside Press Park (ST-12) near Memorial Drive and River Street. The predominant sources of noise was traffic on Memorial Drive and River Street.
- Simultaneous short-term noise measurements were conducted at ST-13 and ST-14 to compare noise levels for I-90 viaduct sources and at-grade sources. Both measurements were conducted 100 feet from the near travel lane of I-90. Site ST-13 was located on Lincoln Street and site ST-14 in the BU area. The noise level for I-90 viaduct sources was 3 dBA quieter than for I-90 at grade sources.

Noise and vibration measurements of MBTA train pass-bys were conducted at V-1/LT-2, approximately 30 feet from the near track, and at 22 Pratt Street (V-2), approximately 180 feet away. Maximum noise levels generated by MBTA train pass-bys at 40 to 50 mph were typically 81 to 82 dBA at 180 feet, and 100 to 105 dBA at 30 feet.



Graphic 4.11-3: Long-Term Highway Noise Measurement Results (LT-1)



Graphic 4.11-4: Long-Term Train Noise Measurement Results (LT-2)

Table 4.11-1: Noise Measurement Results

See Graphic 4.11-6 for noise measurement site locations.

Noise Measurement Site	Location	Start Time (hh:mm)	Noise Level (Leq, dBA)
LT-1	Lincoln & Franklin Street	7:00 AM	81
LT-2	20 Wadsworth Street	8:00 AM	81
ST-1	Lincoln Street & Antwerp Street	1:00 PM	71
ST-2	Lincoln Street & Eric Road	12:20 PM	71
ST-3	Lincoln Street & Mansfield Street	11:30 AM	68
ST-4	14 Wadsworth Street	2:20 PM	57
ST-5	Cambridge Street & Sorrento St	11:20 AM	69
ST-6	10 Buick Street	10:10 AM	69
ST-7	PDW Path	10:00 AM	77
ST-8	Magazine Beach (North)	1:40 PM	60
ST-9	Magazine Beach (South)	10:50 AM	61
ST-10	Magazine Street & Granite Street	9:50 AM	61
ST-11	170-172 Magazine Street	10:10 AM	49
ST-12	Riverside Press Park	10:35 AM	62
ST-13	Lincoln Street	12:00 PM	72
ST-14	Buick Street	11:20 AM	69

Source: MassDOT, 2017 and KM Chng, 2013

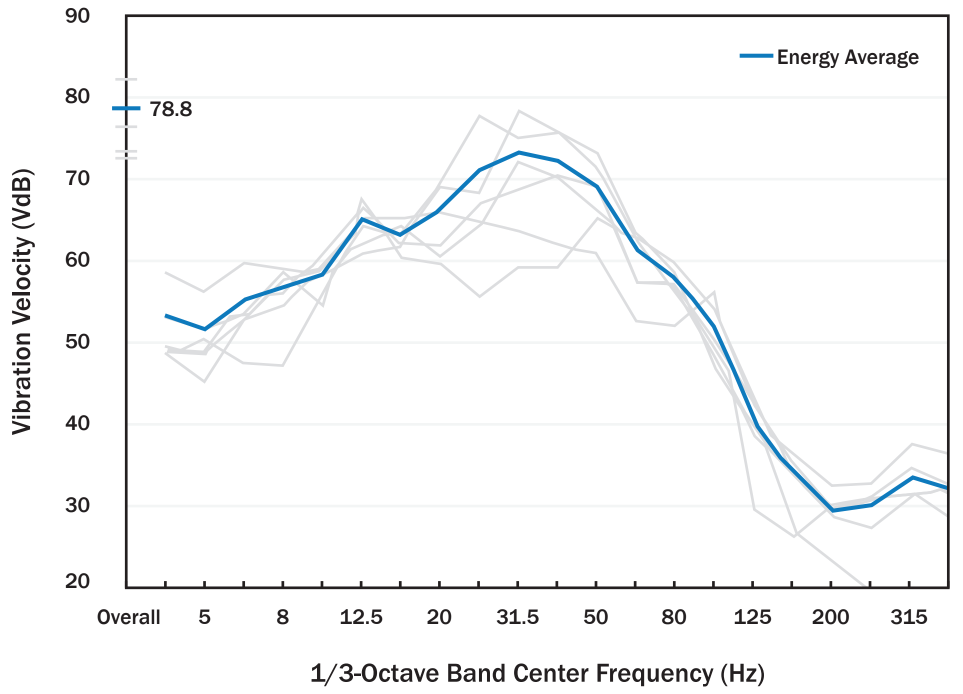
4.11.3.4 Vibration Measurement Results

Vibration generated by MBTA train pass-bys was measured at three locations (V-1, V-2 and V-3) at distances ranging from 30 to 180 feet to the tracks. As shown in Table 4.11-2, the overall vibration levels ranged from 69 to 79 VdB. Graphic 4.11-5 presents the vibration frequency spectrum of MBTA trains at site V-3, which is most predominant in the 25 to 50 Hz range.

Table 4.11-2: Vibration Measurement Results

Vibration Measurement Site	Location	Distance to Near Track (feet)	Overall Vibration Velocity Level (VdB)
V-1	20 Wadsworth Street	30	75
V-2 (LT-2)	22 Pratt Street	180	69
V-3	10 Buick Street	45	79

Source: MassDOT, 2017 and KM Chng, 2013



Graphic 4.11-5: Train Vibration Spectra at 45 feet (V-3)

[redacted]

Graphic 4.11-6: Noise and Vibration Measurement Sites

4.11.3.5 Cambridge Street and Harvard Avenue Area

Noise and vibration-sensitive land use near the intersection of Cambridge Street and Harvard Avenue include single-family and multi-family residences and the Our Future Learning Center daycare on Linden Street. There are mixed-use buildings along Cambridge Street that have upper floor residential receptors without areas of frequent outdoor human use. See Graphic 4.11-7.

The predominant source of current noise in the Project Area is traffic on local roads such as Cambridge Street, Harvard Avenue and Linden Street. I-90 is approximately 150 feet away from the closest receptors. The Cambridge Street bridge and retaining walls south of the mainline tracks provide acoustic shielding to the trains which are approximately 50 feet away from the closest receptors.

As shown in Table 4.11-3, the existing noise level at the closest receptors such as CS-1 and CS-2 is 77 dBA (Leq) due primarily to contribution of noise from Cambridge Street. Existing noise levels at receptors farther setback from the project corridor range from 60 to 70 dBA (Leq).

Table 4.11-3: Existing Noise Levels – Cambridge Street & Harvard Ave

Receptor Number	Location	Loudest-Hour Noise Level (Leq, dBA)	Day-night Average Level (Ldn, dBA)
CS-1	Our Future Learning Center	77	n/a
CS-2	1 Linden Street	77	79
CS-3	326 Cambridge Street	74	76
CS-4	1 Harvard Avenue	68	70
CS-5	3 Linden Street	66	68
CS-6	15 Linden Street	60	62

n/a - Ldn noise levels are not applicable to park and recreational uses

4.11.3.6 Allston Village and Pratt Street/Wadsworth Street Area

Receptors in the Allston Village and Packards Corner neighborhoods primarily include single and multi-family residences such as those on Pratt Street and Wadsworth Street south of the Worcester Main Line tracks. The existing noise environment is dominated by commuter train operations which in some locations are approximately 35 feet from the facades of the nearest residential buildings. The contribution of noise from I-90 is relatively low in this area since it is approximately 400 feet or farther from most receptors, as shown in Graphic 4.11-7.

As shown in Table 4.11-4, existing noise levels at the closest receptors such as AV-1 and AV-2 are 79 dBA (Leq) and 82 dBA (Ldn) due primarily to MBTA commuter train operations. Buildings on Wadsworth Street provide acoustic shielding to receptors set back farther from the tracks. At second and third row receptors, existing noise levels are modeled to be in the range of 60 to 70 dBA (Leq).

Table 4.11-4: Existing Noise Levels – Allston Village and Pratt Street/Wadsworth Street Area

Receptor Number	Location	Loudest-Hour Noise Level (Leq, dBA)	Day-night Average Level (Ldn, dBA)
AV-1	18 Sawyer Terrace	79	82
AV-2	10 Wadsworth Street	79	82
AV-3	30 Pratt Street	71	74
AV-4	18 Pratt Street	66	68
AV-5	9 Sawyer Terrace	66	68
AV-6	11 Wadsworth Street	65	68
AV-7	33 Pratt Street	63	65
AV-8	72 Ashford Street	60	63
AV-9	New Balance Field	58	n/a
AV-10	Malvern Softball	59	n/a
AV-11	53 Ashford Street	58	60
AV-12	18 Ashford Street	58	61

n/a - Ldn noise levels are not applicable to park and recreational uses

LINCOLN STREET
RIDGE STREET

[redacted]

Graphic 4.11-7: Existing Noise Levels at Receptors near Cambridge Street, Harvard Avenue, Allston Village and Packards Corner Neighborhood

MBTA commuter train operation north of residences on Wadsworth Street

Boston University noise measurement location

4.11.3.7 Boston University (West Campus) Area

Noise and vibration-sensitive land use in the BU area include classrooms, a concert hall and an art gallery in the College of Fine Arts and the College of General Studies, dormitory residences at 10 Buick Street, 33 Harry Agganis Way, and West Campus and recreational facilities including Nickerson Field, New Balance Field and the Track & Tennis Center. See Graphic 4.11-8.

The existing noise environment in the BU area includes contributions from traffic on the elevated I-90 viaduct, SFR and local streets such as Buick Street; and rail noise from MBTA commuter rail operations, GJR freight trains, and Houghton Chemical train movements.

As shown in the photo above, vehicles on I-90 are shielded by the viaduct for ground-level receptors near the corridor, and there is a direct line of sight to train operations underneath the viaduct and to vehicles on SFR. There is a direct line of sight to I-90 from upper floor receptors at the BU dormitory, but the viaduct shields noise from train operations.

As shown in Table 4.11-5, existing noise levels at the closest first-row receptors in the BU Area range from 74 to 81 dBA (Leq) due primarily to the contribution of noise from I-90, SFR and train operations.

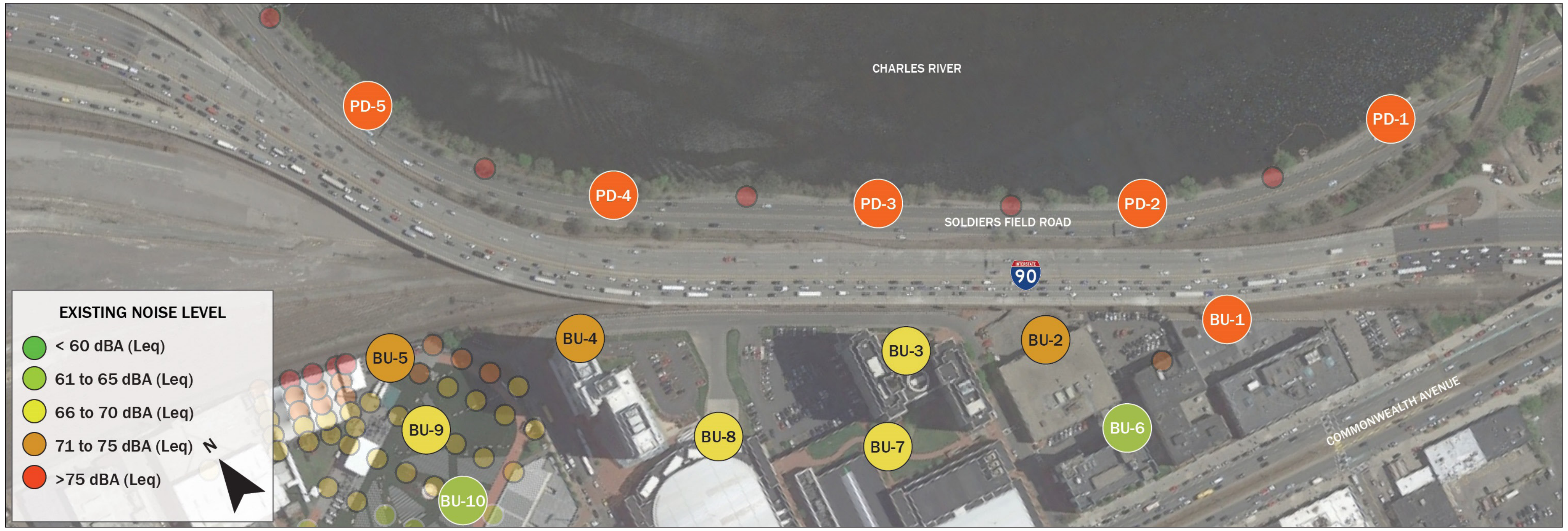
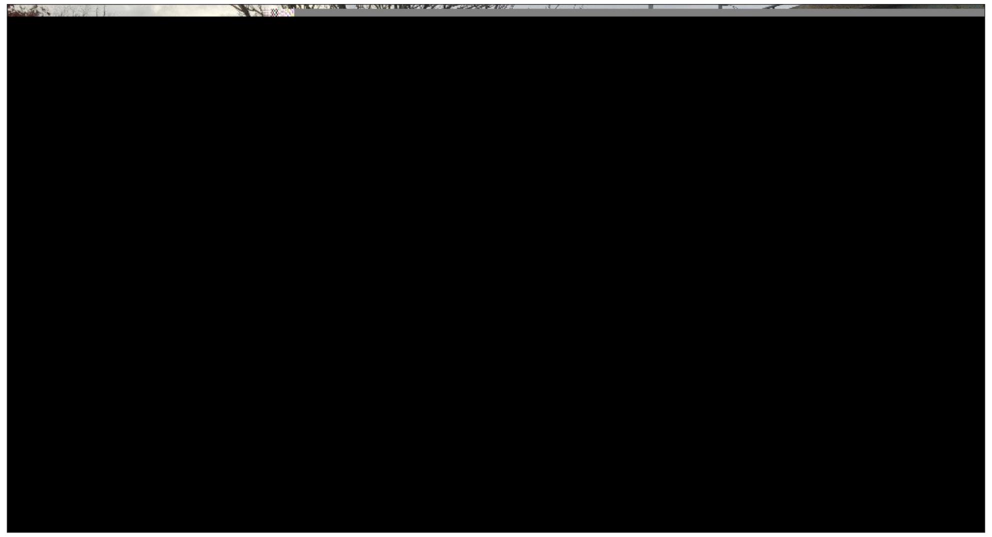

CHARLES RIVER
PD-5
PD-4
PD-3
PD-2
PD-1
SOLDIERS FIELD ROAD
90
BU-1
BU-2
BU-3
BU-4
BU-5
BU-6
BU-7
BU-8
BU-9
BU-10
COMMONWEALTH AVENUE
EXISTING NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
66 to 70 dBA (Leq)
71 to 75 dBA (Leq)
>75 dBA (Leq)
N

Table 4.11-5: Existing Noise Levels – Boston University Area



PDW Path noise measurement location

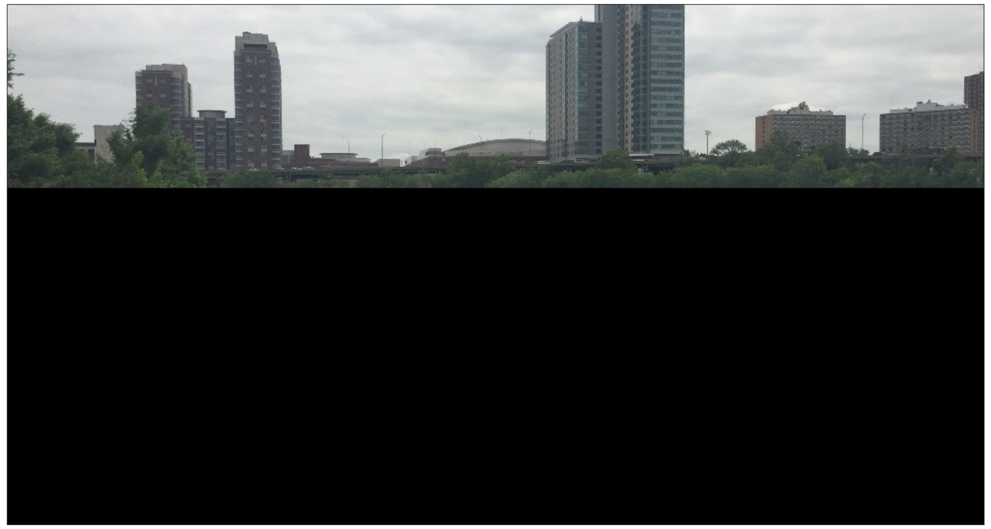
4.11.3.8 PDW Path

The PDW Path provides pedestrian and bicycle access along the south bank of the Charles River in the Project Area. The path extends from the BU Bridge to Cambridge Street/River Street. Only a guardrail and narrow strip of grass separate the path from SFR. The path is approximately 85 feet from the nearest edge of the I-90 viaduct and 200 feet from the Framingham/Worcester Main Line tracks. Due to the close proximity to SFR and the fact that most vehicles on I-90 are shielded by the viaduct structure, the predominant source of noise on the path is traffic on SFR. As shown in Table 4.11-6, existing noise levels along the path are generally 76 to 78 dBA (Leq).

Table 4.11-6: Existing Noise Levels – PDW Path

Receptor Number	Location	Loudest-Hour Noise Level (Leq, dBA)	Day-night Average Level (Ldn, dBA)
PD-1	PDW Path	77	n/a
PD-2	PDW Path	79	n/a
PD-3	PDW Path	79	n/a
PD-4	PDW Path	78	n/a
PD-5	PDW Path	78	n/a
PD-6	PDW Path	77	n/a
PD-7	PDW Path	76	n/a

n/a - Ldn noise levels are not applicable to park and recreational uses



Magazine Beach noise measurement location

4.11.3.9 Magazine Beach/Cambridgeport

Magazine Beach, in the City of Cambridge, has several recreational facilities including a trail along the northern banks of the Charles River, a baseball diamond, soccer field, and the Veteran's Memorial swimming pool. Other noise-sensitive receptors in Cambridgeport include the Morse Elementary School and playground, the Courtyard Marriott Hotel, and residences setback 300 feet or farther north of Memorial Drive. As shown in Graphic 4.11-9, the closest receptors at Magazine Beach are approximately 500 feet from the nearest Project roadway (SFR). Residences in Cambridgeport are approximately 1,500 feet or farther away from the Project.

The predominant sources of noise at Magazine Beach include traffic on Memorial Drive, SFR and I-90, and train operations on the Framingham/Worcester line. Although traffic on I-90 can be audible at residential receptors north of Memorial Drive, the predominant source of noise is traffic on Memorial Drive and local streets. Observations have been made of audible noise from trucks using air-compression braking on I-90.

As shown in Table 4.11-7, existing noise levels at Magazine Beach range from 63 to 67 dBA (Leq). In Cambridgeport, existing noise levels at residences set back from Memorial Drive, such as CP-2 to CP-6, are quieter ranging from 57 to 60 dBA (Leq). Table 4.11-8 summarizes the existing noise levels at the Morse Elementary School and residences in Cambridgeport.

Table 4.11-7: Existing Noise Conditions at Magazine Beach

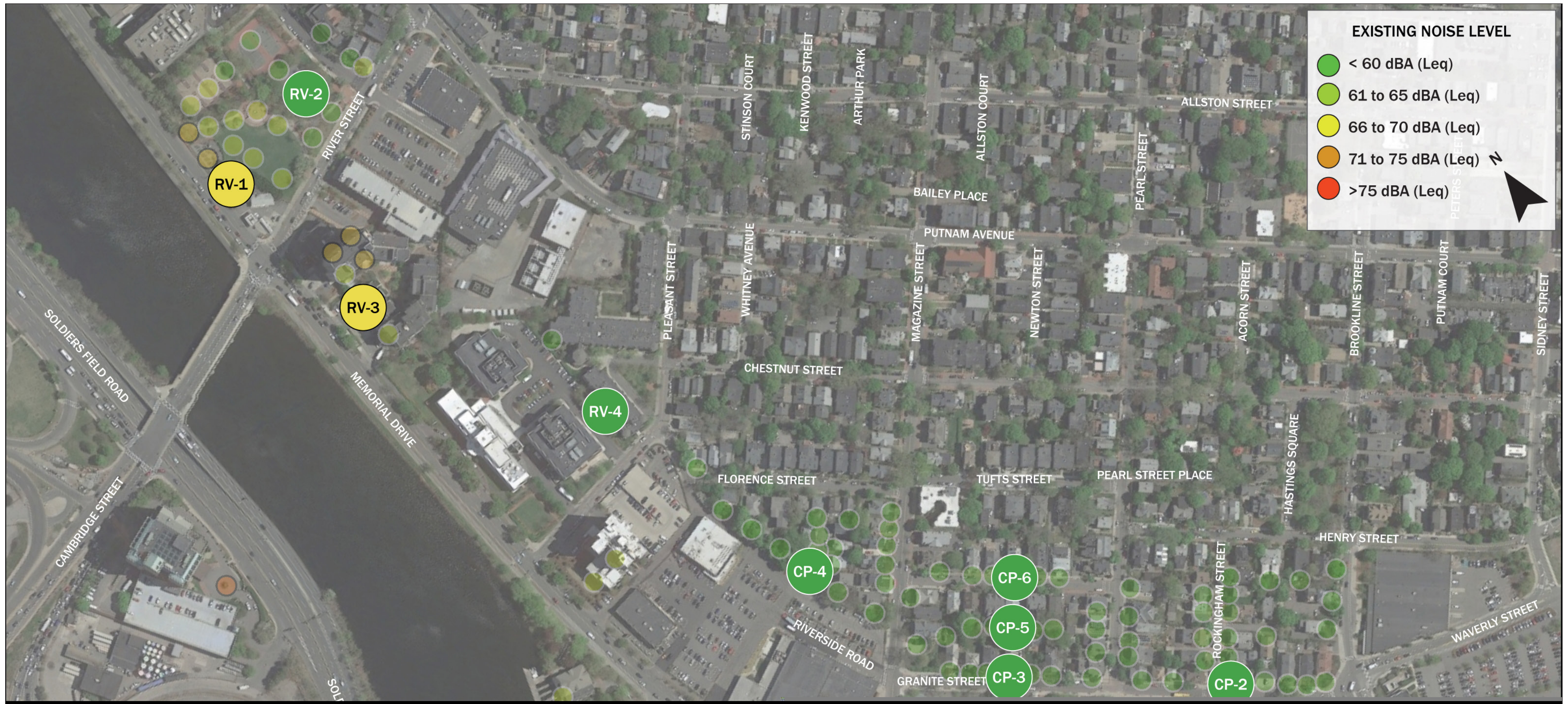
Receptor Number	Location	Loudest-Hour Noise Level (Leq, dBA)	Day-night Average Level (Ldn, dBA)
MB-1	Magazine Beach Trail	67	n/a
MB-2	Magazine Beach Trail	67	n/a
MB-3	Veteran's Memorial Pool	63	n/a
MB-4	Soccer Field	65	n/a
MB-5	Magazine Beach Train	65	n/a
MB-6	Soccer Field Near Memorial Drive	66	n/a

n/a - Ldn noise levels are not applicable to park and recreational uses.

Table 4.11-8: Existing Noise Conditions at Cambridgeport

Receptor Number	Location	Loudest-Hour Noise Level (Leq, dBA)	Day-night Average Level (Ldn, dBA)
CP-1	Morse Elementary School	66	n/a
CP-2	32 Rockingham Street	59	61
CP-3	47 Granite Street	60	62
CP-4	6 Gordon Place	57	59
CP-5	26 Glenwood Avenue	59	61
CP-6	23-25 Glenwood Avenue	58	60

n/a - Ldn noise levels are not applicable to park and recreational uses


EXISTING NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
66 to 70 dBA (Leq)
71 to 75 dBA (Leq)
>75 dBA (Leq)
N
RV-1
RV-2
RV-3
RV-4
CP-2
CP-3
CP-4
CP-5
CP-6
RIVER STREET
SOLDIERS FIELD ROAD
MEMORIAL DRIVE
CAMBRIDGE STREET
STINSON COURT
KENWOOD STREET
ARTHUR PARK
ALLSTON COURT
ALLSTON STREET
PEARL STREET
BAILEY PLACE
PUTNAM AVENUE
PLEASANT STREET
WHITNEY AVENUE
MAGAZINE STREET
NEWTON STREET
ACORN STREET
BROOKLINE STREET
PUTNAM COURT
SIDNEY STREET
CHESTNUT STREET
FLORENCE STREET
TUFTS STREET
PEARL STREET PLACE
HASTINGS SQUARE
HENRY STREET
RIVERSIDE ROAD
GRANITE STREET
ROCKINGHAM STREET
WAVERLY STREET

Graphic 4.11-9: Existing Noise Levels at Receptors in Magazine Beach, Cambridgeport and Riverside

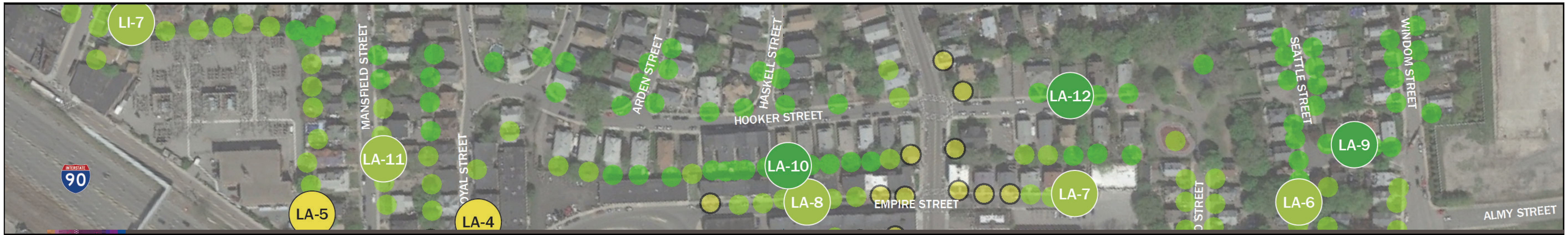
4.11.3.10 Riverside Area

As shown in Graphic 4.11-9 noise-sensitive land use in Riverside, near River Street in Cambridge, includes multi-family residential buildings such as Winn Residential, a high-rise building on Memorial Drive with outdoor balconies, residences on Blackstone Street, and Putnam Avenue and Riverside Press Park.

The most significant existing noise sources in this area are traffic on Memorial Drive and River Street. As shown in Table 4.11-9, existing noise levels are typically 67 dBA (Leq) at residential receptors such as RV-3 and near 60 dBA at Riverside Press Park (RV-1).

Table 4.11-9: Existing Noise Levels – Riverside Area

Receptor Number	Location	Loudest-Hour Noise Level (Leq, dBA)	Day-night Average Level (Ldn, dBA)
RV-1	Riverside Press Park	66	n/a
RV-2	Riverside Press Park Playground	60	n/a
RV-3	808 Memorial Drive	67	69
RV-4	173 Pleasant Street	59	61


LI-7
MANSFIELD STREET
LA-11
LA-5
90
OYAL STREET
LA-4
ARDEN STREET
HASKELL STREET
HOOKER STREET
LA-10
LA-8
EMPIRE STREET
LA-12
LA-7
D STREET
SEATTLE STREET
LA-6
LA-9
WINDOM STREET
ALMY STREET

[redacted]

Graphic 4.11-10: Existing Noise Levels at Receptors in Lower Allston (Cambridge Street)

4.11.3.11 Lower Allston (Cambridge Street)

As shown in Graphic 4.11-10, Cambridge Street includes commercial and residential land use on the north side. The most significant source of noise is traffic on Cambridge Street and North Harvard Street. The I-90 access ramps are on retained fill which provide acoustical shielding to traffic and are approximately 250 feet away from receptors on the north side of Cambridge Street.

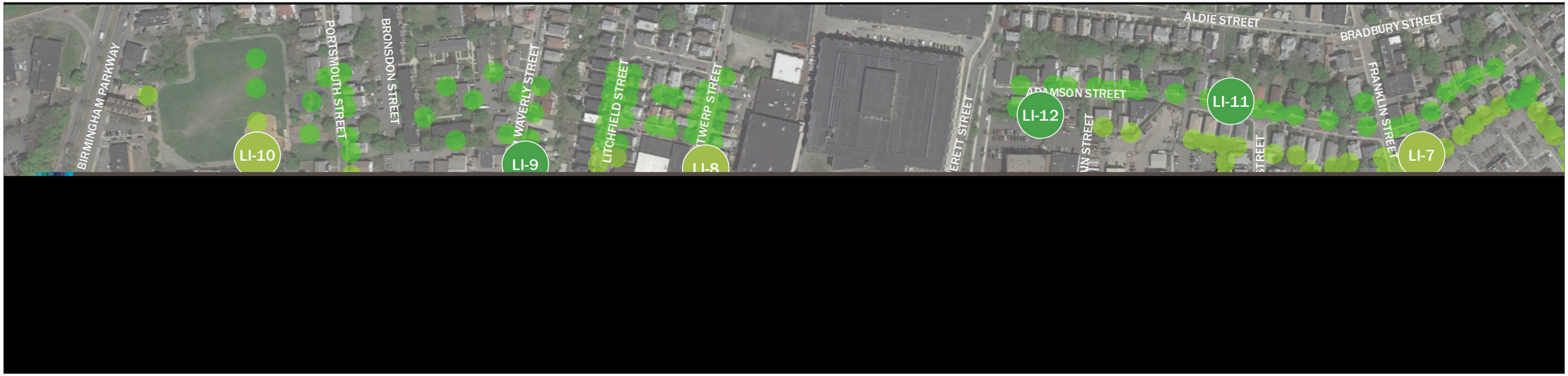
SPEED LIMIT 40

Cambridge Street

As shown in Table 4.11-10, existing noise levels are typically 70 to 75 dBA at first-row receptors and 60 to 70 dBA at receptors set back from Cambridge Street.

Table 4.11-10: Existing Noise Levels – Cambridge Street (Lower Allston)

Receptor Number	Location	Loudest-Hour Noise Level (Leq, dBA)	Day-night Average Level (Ldn, dBA)
LA-1	171 Cambridge Street	70	72
LA-2	193 Cambridge Street	73	75
LA-3	245-247 Cambridge Street	75	77
LA-4	11-15 Royal Street	67	69
LA-5	10 Mansfield Street	68	70
LA-6	12 Seattle Street	62	64
LA-7	100-102 Empire Street	64	66
LA-8	64 Empire Street	64	66
LA-9	5 Amboy Street	61	63
LA-10	51-53 Hooker Street	56	58
LA-11	15 Mansfield Street	63	65
LA-12	102-104 Hooker Street	59	61


BIRMINGHAM PARKWAY
PORTSMOUTH STREET
BRONSDON STREET
WAVERLY STREET
LITCHFIELD STREET
TWERP STREET
ERETT STREET
ADAMSON STREET
N STREET
ALDIE STREET
STREET
BRADBURY STREET
FRANKLIN STREET
LI-10
LI-9
LI-8
LI-12
LI-11
LI-7

Graphic 4.11-11: Lincoln Street Noise Measurement Locations

I-90 from Lincoln Street Noise Measurement Location

4.11.3.12 Lincoln Street – Type II Area

Noise-sensitive land use in Lower Allston near Lincoln Street between the Franklin Street pedestrian bridge and Market Street includes single-family and multi-family residences. This portion of the noise Study Area is included to evaluate the feasibility and reasonableness of potential Type II noise barriers. The predominant source of noise is I-90 which is at grade along this section. Traffic on Lincoln street also contributes to the noise environment. See Graphic 4.11-11.

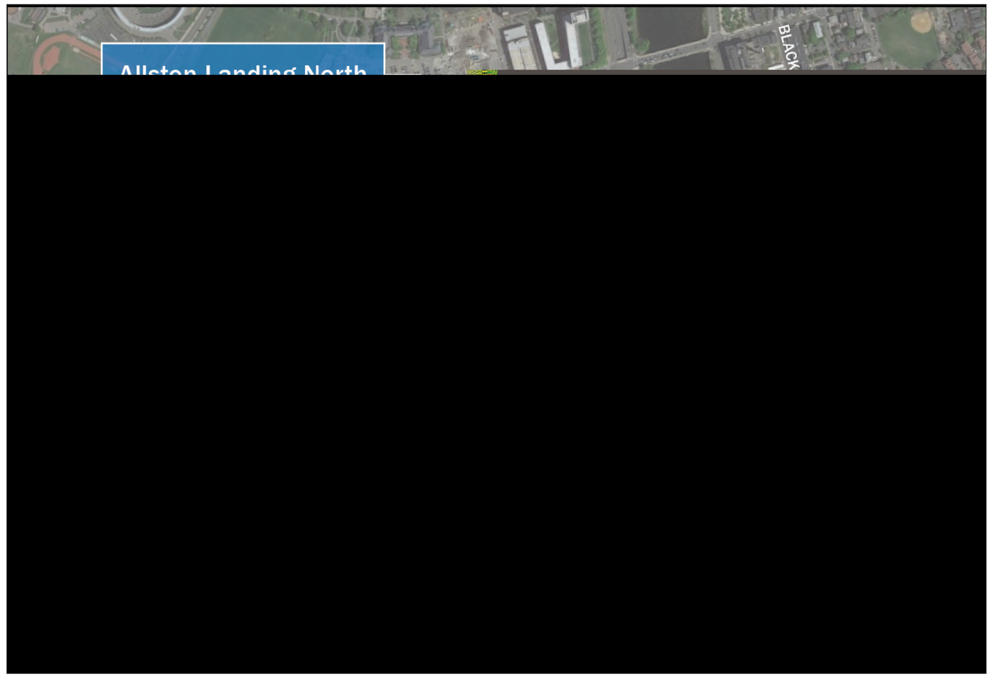
As shown in Table 4.11-11, existing noise levels at the closest receptors such as LI-1 to LI-5 range from 73 to 75 dBA (Leq). At receptors farther setback from I-90, existing noise levels generally range from 57 to 71 dBA (Leq).

Table 4.11-11: Existing Noise Levels – Lincoln Street

Receptor Number	Location	Loudest-Hour Noise Level (Leq, dBA)	Day-night Average Level (Ldn, dBA)
LI-1	290-292 Lincoln Street	74	77
LI-2	2 Eric Road	73	75
LI-3	213 Lincoln Street	73	76
LI-4	142-144 Lincoln Street	73	75
LI-5	54-56 Lincoln Street	75	77
LI-6	14 Lincoln Street	71	73
LI-7	20-22 Alcott Street	63	65
LI-8	57 Antwerp Street	65	67
LI-9	5 S Waverly Street	56	58
LI-10	Portsmouth Playground	59	n/a
LI-11	56-58 Adamson Road	57	59
LI-12	3 Adamson Street	57	59

I-90 from the intersection of Lincoln Street and Antwerp Street

Allston Landing North Area



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Allston Landing North and South Areas

4.11.3.13 Allston Landing North Area

The Project will include improvements to Cambridge Street near Allston Landing North, which is land owned by Harvard University Beacon Yards, LLC north of Cambridge Street. There are no existing noise-sensitive uses in Allston Landing North. Existing residences to the west of Allston Landing North, such as those on Windom Street, have been evaluated in this analysis as part of the Cambridge Street Area. Harvard's Science and Engineering Center north of the Allston Landing North area has recently been permitted and is currently under construction.

The predominant existing sources of noise in this area include traffic on Cambridge Street, the I-90 access ramp and SFR. There is an existing noise wall, approximately 16 feet in height on the western property boundary along the backyards of residences on Windom Street.

Since new roadways within Allston Landing North are not part of the Project, future noise conditions will not be evaluated for potential mitigation according to the MassDOT Noise Abatement Criteria (NAC). Future noise conditions at sample locations within the area are presented in Section 5.11 for informational purposes only.

4.11.3.14 Allston Landing South Area (Innovation Area)

The Project will introduce a new roadway network in the Allston Landing South Area, which is land owned by Harvard University and MassDOT between Cambridge Street and the Allston Village and Pratt Street/Wadsworth Street area. The area includes I-90, the Framingham/Worcester Main Line and the former CSX railroad yard that was purchased by Harvard University. Harvard is planning substantial developments in this area, such as mixed-use residential, commercial and institutional properties. There will also be potential for air rights developments over I-90 and BPY. Since there are no existing receptors in this area and no specific noise-sensitive uses have been permitted within the area, future noise conditions will not be evaluated for potential impact according to the MassDOT NAC. Section 5.11 provides information on the predicted future noise conditions at representative locations throughout this area for informational purposes only.

4.12 Wetlands and Waterways

The Charles River is located along the eastern Project limit and contains natural resources that are protected under the Massachusetts Wetlands Protection Act (MA WPA) and under the U.S. Clean Water Act and Rivers and Harbors Act. The MA WPA is a state law that is administered locally by the Boston Conservation Commission. The Charles River Basin Master Plan (DCR, 2002) was developed as a guide for management, planning and design decisions affecting the Charles River Basin and Mass DEP Chapter 91 Public Waterfront Act. The US Clean Water Act and Rivers and Harbors Act are administered by the U.S. Army Corps of Engineers (USACE).

The Charles River Master Plan divides the basin into three zones: the Lower Basin extends from the Charles River Dam to the BU Bridge; the Middle Basin occupies the area from the BU Bridge to Herter Park; and the Upper Basin extends from Herter Park to the Watertown Dam. The eastern Project limit is adjacent to the Middle Basin between the BU Bridge and the Western Avenue Bridge.

The width of the Charles River varies throughout the Project Area. The river is approximately 330-feet-wide at the BU Bridge; it widens to between 500 and 640 feet in the area of Magazine Beach, and narrows to approximately 350 feet between the River Street and Western Avenue Bridges. The water levels of the river are controlled by the new Charles River Dam located 2.5 miles to the east of the Project just downstream of the Zakim Bridge. When the historic Charles River Dam, located at the Craigie Bridge, was constructed in the early 1900s, the tidal Charles River was converted to what could be considered a freshwater lake. The river was dredged and hundreds of acres of marsh were filled. According to the Charles River Master Plan, most of the riverbank was armored to retain the dredged soil of the embankments. This sloping stone work or riprap is visible at the water's edge today, but much of it is covered by bank vegetation.

Vegetation along the riverbank in the Project Area can be described as forest/shrub strips, characterized by thick stands of volunteer shrubs and trees. The Charles River Master Plan indicates that, in most instances, invasive species such as false indigo bush (Amorpha fruticosa) dominate the forest/shrub streps and obstruct views to the river. In addition to other deciduous species, pioneer tree species, such as river birch (Betula nigra), indicative of disturbance, often dominate these stands.

Many of the forest/shrub strips in the Middle Basin are less than 25 feet wide and have some value as urban based wildlife habitat. According to the Master Plan, research has shown that as these forest/shrub strips narrow to less than 25 feet in width, there is a loss of habitat value due to the quantity and quality of available wildlife shelter. The presence of pedestrians and dogs on nearby paths reduces further the wildlife habitat value of these forest/shrub strips. The Project Area contains federal and state jurisdictional wetland resource areas and waterways associated with the river. USACE and the U.S. EPA jointly define wetlands as: Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

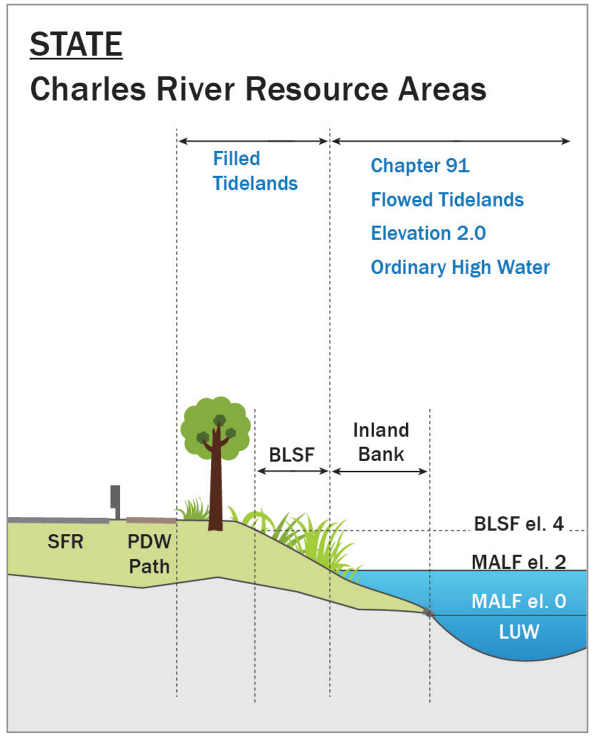
The water elevations in the Charles River can fluctuate daily based on contributing rainfall and upcoming storm events where the Charles River Dam operator may lower the elevation of the river by releasing water through the dam to alleviate potential upstream flooding. The elevation of Mean Annual Flood Level (MAFL) and Mean Annual Low Flow (MALF) were determined based on past environmental permits filed for work within the Charles River, a review of this historic water levels at the Charles River Dam and First Street Station in Cambridge river gauges and input from the Woods Hole Group who studied the Charles River Dam in conjunction with a flood study.

State and federal wetlands and waterways jurisdictions are based on elevations of the water surface of the Charles River. For the purposes of this DEIR, unless otherwise noted, all elevations are expressed in North American Vertical Datum of 1988 feet (NAVD88). There are three state wetland resources areas associated with the river including Land Under Water (LUW) (area below elevation 0); Bank underlying an anadromous/catadromous fish run (Bank) (area between elevation 0 and 2), and Bordering Land Subject to Flooding (BLSF) (area between elevation 2 and 4). The federal wetland and waterway resources of the Charles River, regulated by the USACE, are defined as Non-tidal federal Navigable Water of the United States (WUS) (area below elevation 2). State Chapter 91 Waterways jurisdiction is defined as Ordinary High Water (OWH), the landward limit of flowed tidelands, which is also the area below elevation 2.

4.12.1 State and Federal Wetland Resource Areas

State

In Massachusetts, resource areas associated with the Charles River are protected under the MA WPA include LUW, Bank, BLSF and Riverfront Area. These areas are described in further detail below. Note: there is no Bordering Vegetated Wetland along the Charles River in the Project vicinity. See Graphic 4.12-1 and Figure 4.12-1 for existing state wetland resource areas.



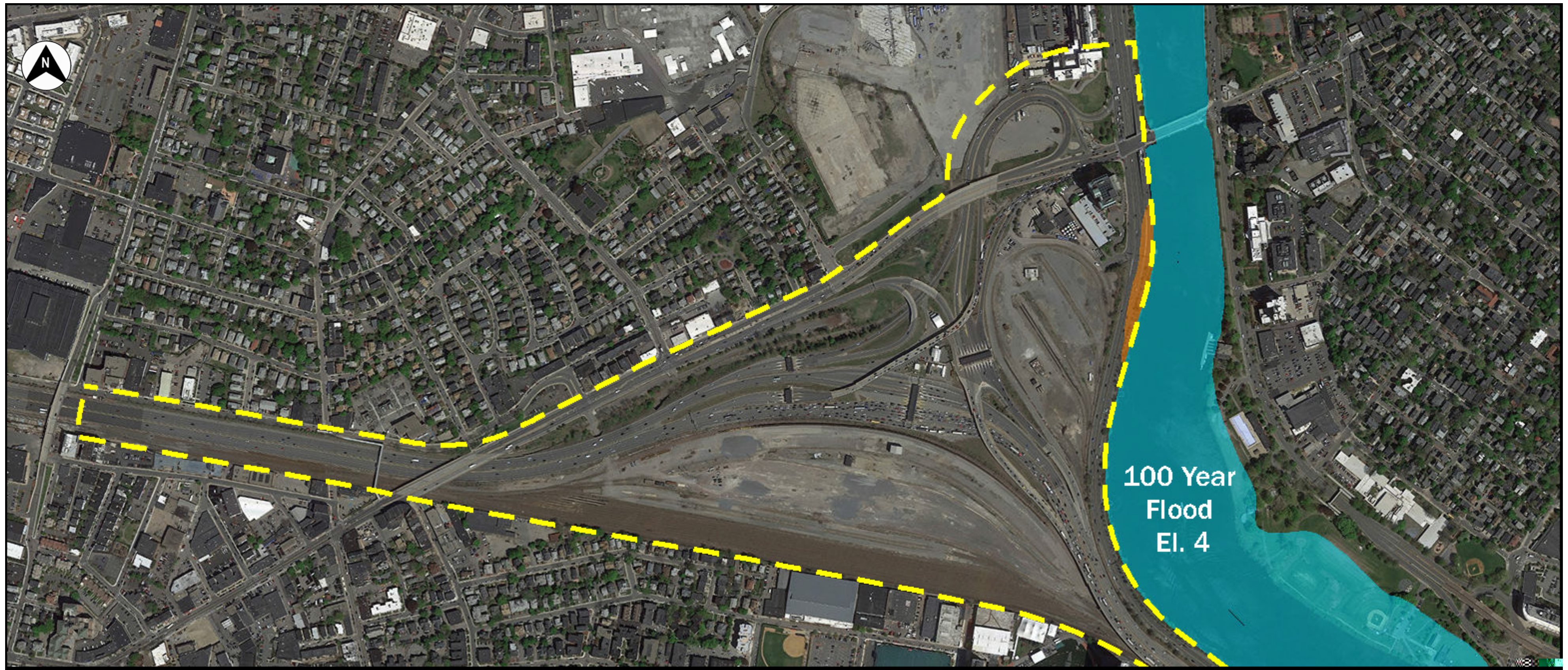
Graphic 4.12-1: Charles River State Resource Areas

Land Under Water Bodies and Waterways

The MA WPA defines LUW as the land beneath any creek, river, stream, pond or lake, which may be composed of organic muck or peat, fine sediments, rocks or bedrock. The land beneath the Charles River is considered LUW. The landward boundary of LUW is the MALF level of the Charles River which is elevation 0 feet, North American Vertical Datum of 1988 (NAVD88).

Inland Bank

As defined in the MA WPA, a Bank is the portion of the land surface which normally abuts and confines a water body. A Bank may be partially or totally vegetated, or it may be comprised of exposed soil, gravel or stone. The Charles River contains banks on both sides that confine and abut the waterway. In accordance with 310 CMR 10.54 (2)(c) The upper boundary of a Bank is the first observable break in the slope or the mean annual flood level, whichever is lower. The lower boundary of a Bank is the mean annual low flow level. The banks of the Charles River in the Project area have a generally uniform slope. The first observable break in slope is at the top of the river bank which is located approximately at elevation 6 which is higher than MAFL. The lower boundary of Inland Bank is the MALF level, elevation 0 feet (NAVD88); the upper boundary of the Inland Bank is the MAFL, which is elevation 2 feet (NAVD88). The upper boundary of the Inland Bank is the lower limit of the adjacent floodplain



Graphic 4.12-2: FEMA Flood Zone Layer

The area within 100 feet of the bank, measured from the upper boundary of the bank into the adjacent upland to the west, is considered the 100-foot buffer zone under the MA WPA and consists of the PDW Path, landscaped parkland and portions of SFR. The 100-foot buffer zone to Bank extends beyond the eastbound lanes of SFR for approximately 10 feet. The toe of the slope is armored with stone.

Riverfront Area

Under the MA WPA, Riverfront Area is the area of land between a river's mean annual high water line and a parallel line measured horizontally. In the Project Area (Boston), the Riverfront Area is 25 feet in width adjacent to the Charles River because it is within a municipality with a population of 90,000 people or more, as defined in the MA WPA. The 25-foot Riverfront Area is measured from the MAFL, elevation 2 feet (NAVD88) and extends approximately 5 feet onto SFR to the west. It also extends to the exit ramp at Cambridge Street/River Street for a distance of approximately 500 feet. Vegetated portions of Riverfront Area in the Project Area include the forest/shrub strips described above, characterized by thick stands of volunteer shrubs and trees. Under 310 CMR 10.58 (6) of the MA WPA Regulations, because the Project requires a Chapter 91 Waterways License, it is exempted from the Riverfront Area requirements, provided the Project obtains a license, permit, or authorization under 310 CMR 9.00, the Waterways Regulations.

Bordering Land Subject to Flooding/100 Year Flood Zone

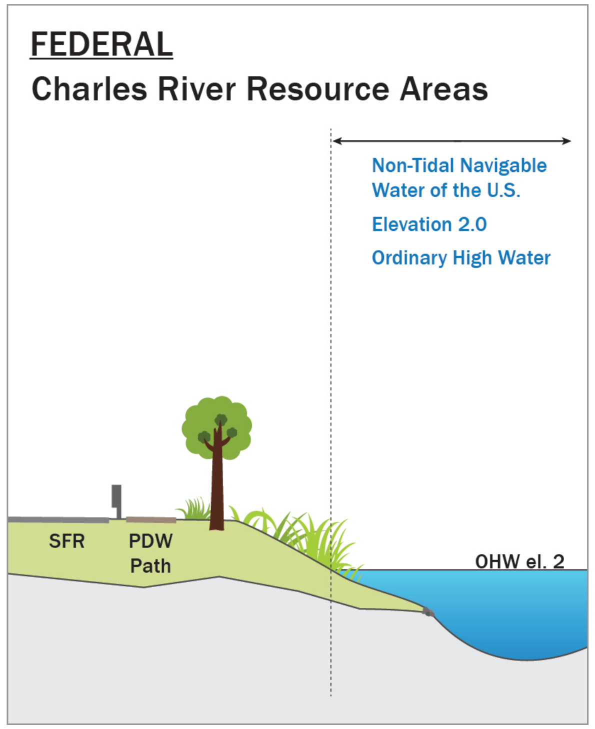
The Federal Emergency Management Agency (FEMA) is responsible for establishing the flood zone elevation or height of water during certain flood events. FEMA publishes Flood Insurance Rate Maps (FIRMs) showing flood hazard areas. The Flood Map showing the Project Site is Map 25025C0076G, dated September 25, 2009, panel 76 of 151. The 100-year flood is an event that has a 1% probability of occurring in any given year. For this section of the Charles River, FEMA has determined that the river will rise to elevation 4.0 feet (NAVD88) during the 100-year event. Under the MA WPA, the boundary of BLSF is the estimated maximum lateral extent of flood water which will result from the 100-year event. The lower boundary of BLSF is the MAFL (top of the Inland Bank), elevation 2.0 feet (NAVD88); and the upper boundary is the limit of the 100-year flood, elevation 4.0 feet (NAVD88). See Graphics 4.12-1 and 4.12-2.

Bank of Charles River along SFR

The land elevations just off the edge of SFR range from elevation 7 +/- feet near the River Street Bridge to 5 feet +/- near the BU Bridge. This means that during a 100-year flood, the Charles River floodwaters are not expected to reach the roadway as the water will be confined within the physical banks of the river and not extend onto the adjacent SFR or PDW Path.

Federal Wetlands and Waters

The Charles River is also subject to federal protection under the Rivers and Harbors Act and the Clean Water Act, both administered by the USACE.


FEDERAL
Charles River Resource Areas
Non-Tidal Navigable Water of the U.S.
Elevation 2.0
Ordinary High Water
SFR
PDW Path
OHW el. 2

Graphic 4.12-3: Charles River Federal Resource Areas

Waters of the US

The Charles River is considered a non-tidal navigable water of the U.S. and any work within the river below the OHW line, elevation 2.0 (NAVD88) or within federal wetlands, is subject to a permit from the USACE. The USACE regulates construction and other work in navigable waterways under Section 10 of the Rivers and Harbors Act of 1899, and has authority over the discharge of dredged or fill material into the "Waters of the United States" (a term which includes wetlands and all other aquatic areas) under Section 404 of the Clean Water Act. As described above, there are no vegetated wetlands in the Project Area and the USACE jurisdiction in the Project Area is limited to below OHW, elevation 2.0, of the Charles River. See Graphic 4.12-3 and Figure 4.12-2 for federal jurisdiction.

4.12.2 State Waterways

Chapter 91 Waterways Public Waterfront Act

The Commonwealth's primary tool for protection and promotion of public use of its waterways is Massachusetts General Law Chapter 91, the Public Waterfront Act licensing program "Chapter 91." Chapter 91 regulates activities on both coastal and inland waterways, including construction, dredging and filling in tidelands, and certain rivers and streams. The purpose of the Chapter 91 program is to preserve and protect the rights of the public by implementing the "Public Trust Doctrine," a legal principle which holds that the air, the sea and the shore belong not to any one person, but rather to the public at large. Chapter 91 also seeks to guarantee that private uses of tidelands and waterways serve a proper public purpose. The Waterways Regulation Program at MassDEP oversees Chapter 91. In general, the goals of the Chapter 91 regulations with regards to Nonwater Dependent Infrastructure Facilities are:

- protection of maritime commerce, industry, recreation and associated public access;
- protection, restoration, and enhancement of living marine resources;
- attainment of water quality goals;
- reduction of flood and erosion-related hazards on lands subject to the 100-year storm event or to sea level rise, especially those in damage-prone or natural buffer areas;
- protection and enhancement of public views and visual quality in the natural and built environment of the shoreline; and
- preservation of historic sites and districts, sites and other significant cultural resources near waterways.

Geographical Jurisdiction

Chapter 91 comprises four basic areas of geographical jurisdiction including Flowed Tidelands, Filled Tidelands, Great Ponds and Non-Tidal Rivers and Streams. See Graphic 4.12-4 and Figure 4.12-3. Any activity that takes place in one of these areas requires Chapter 91 authorization. The two areas applicable to the Project Area include:

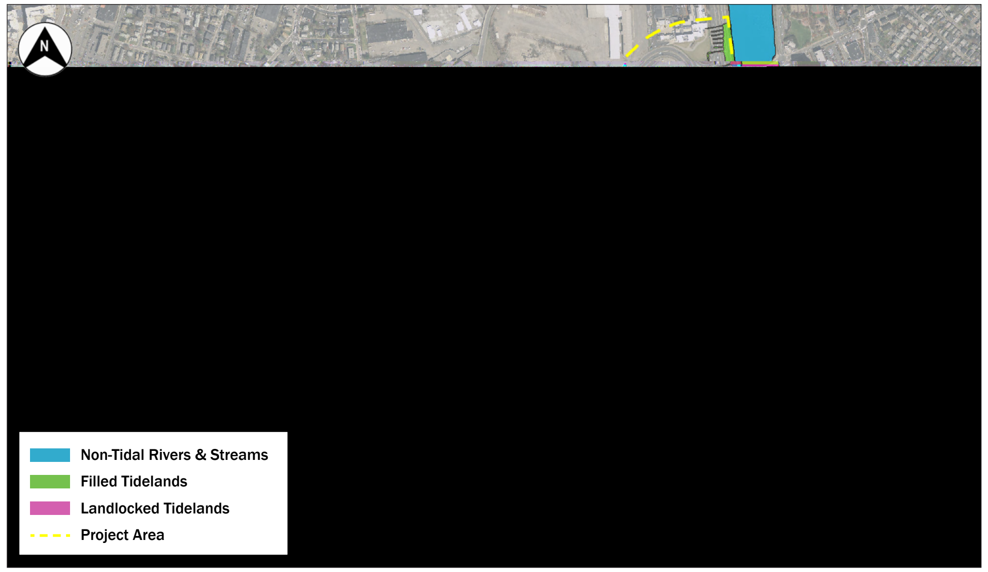
- **Non-Tidal Rivers and Streams:** Projects located in, on, over or under any non-tidal, navigable river or stream on which public funds have been expended either upstream or downstream within the river basin, except for any portions not normally navigable during any season by any vessel.
- **Filled Tidelands:** The limit on Filled Tidelands is: (A) Outside Designated Port Areas, the first public way or 250 feet from mean high water, whichever is farther landward; and (B) Inside Designated Port Areas, the historic MHW shoreline (i.e., all filled areas).

Two areas within the Project Area fall under Chapter 91 jurisdiction: the Charles River itself and the area within the Filled Tidelands adjacent to the Charles River. Any activity that takes place in these areas requires Chapter 91 authorization.

The Charles River is a Non-Tidal River on which public funds have been expended either upstream or downstream within the river basin, placing it under Chapter 91 jurisdiction. The upper limit of Flowed Tidelands associated with the Charles River in the Project Area is OHW which is located at elevation 2 feet (NAVD88).

The Project Area west of the Charles River that was historically Flowed Tidelands is considered Filled Tidelands. The Project Area is not located within a Designated Port Area, and as such, the limit of Filled Tidelands is the first public way or 250 feet from OHW, whichever is farther landward. SFR is the first public way, but is located less than 250 feet from OHW. Therefore, the limit of Filled Tidelands in the Project Area is 250 feet from OHW. Filled Tidelands located more 250 feet from OHW are considered Landlocked Tidelands. Landlocked Tidelands are defined as "Filled Tidelands, which on January 1, 1984, were entirely separated by a public way or interconnected public ways from any Flowed Tidelands, except for any portion of such Filled Tidelands that are presently located within 250 feet of the high-water mark of Flowed Tidelands." Landlocked Tidelands are not subject to licensing under the Chapter 91 Regulations but they are subject to Public Benefit Review by the Secretary of EOEEA as part of the MEPA process.

The Project is also not located within the Coastal Zone as mapped by the Coastal Zone Management Agency.



Graphic 4.12-4: MassGIS Chapter 91 Tidelands Layer

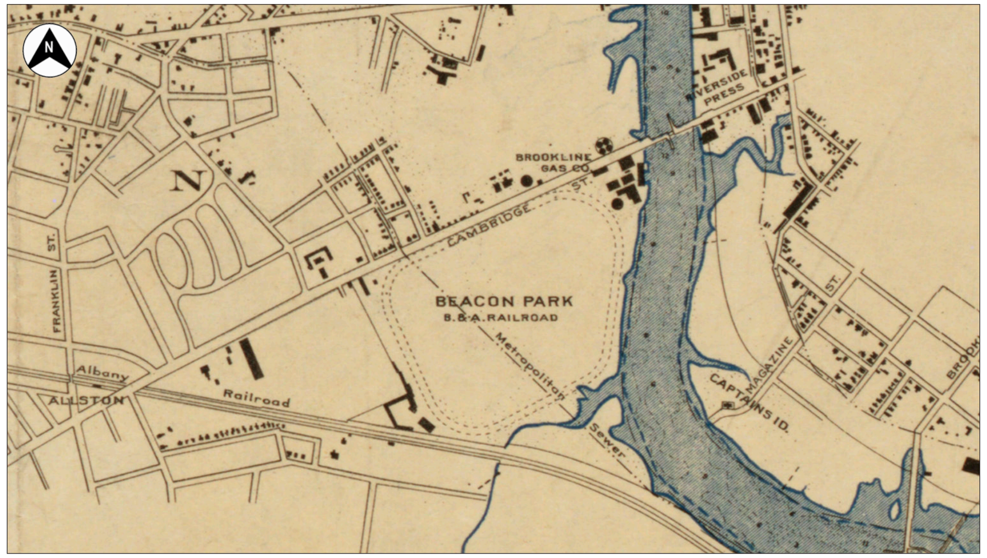
History of Fill and Licensing

The extent of Filled Tidelands is based upon the Historic Mean High Water (HMHW) Mark which is the high-water mark that existed prior to human alteration of the shoreline by filling, dredging, excavating, impounding or other means. In 2006 the Massachusetts Coastal Zone Management office commissioned a study to map tidelands jurisdiction for use by MassDEP, pursuant to Chapter 91 and the Waterways Regulations. The study resulted in a historic high water line that is intended to represent the presumptive limit of MassDEP jurisdictional Filled Tidelands. In the absence of additional information, MassDEP will consider the line to represent the historic high water mark.

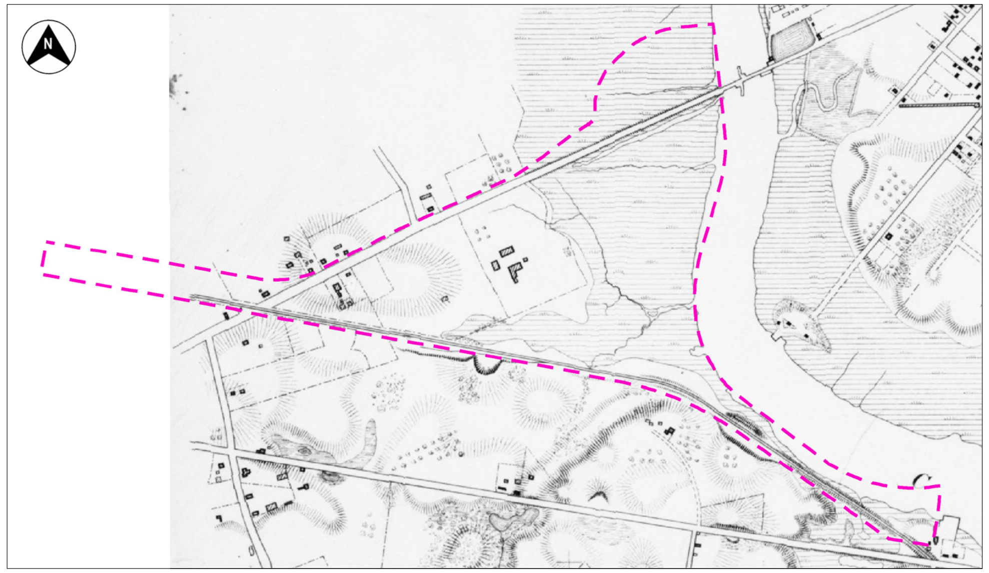
For the Project Area, the study determined that the presumptive Historic Mean High Water is based on two plans: Plan of the Charles River From Waltham Line to Boston Harbor (1894) and U.S. Coast Survey, A.D Bache (1877).

Within the Project Area, the area was mapped as a swamp with several tributaries to the Charles River including Salt Creek (a.k.a. Smelt Brook). According to the Brighton Allston Historical Society, in 1864 the Beacon Trotting Park, initially called Riverside Trotting Park, was established on the site. This represents the first mapped use of the area and most likely when the area was filled for use as developable land. Beacon Park ceased to exist in the early 1890s when it was sold by its last owners, Jordan and Marsh, to the Boston & Albany Railroad for conversion to a freight yard. I-90 was built in the mid-1960s, well after the area was filled by others.

Numerous Chapter 91 Licenses and Legislative authorizations have been issued within and in the vicinity of the Project Area. The authorizations within Chapter 91 jurisdiction date back to 1871; a full list of Licenses is provided in Appendix I, Chapter 91 Historic Licenses and Legislative Authorizations.



Plan of the Charles River From Waltham Line to Boston Harbor. Prepared under the direction of a joint board consisting of the Metropolitan Park Commission and the State Board of Health Chapter 475, Acts of 1893 - April 1894



U.S. Coast Survey A.D Bache Supt. - Roxbury Cambridge and Medford Massachusetts Surveyed in 1847 by H.L Whitting Assist. Register No 233 bis Copied by E.F Sommer December 1877

4.13 Floodplains

The Charles River occasionally experiences flooding from intense weather events such as storms producing heavy rains, hurricanes, blizzards and Nor'easters. River flooding occurs when river levels rise and overflow their banks and inundate areas that are normally dry.

The major tributary streams to the Charles River include Mill Creek, Mother Brook and Stony Brook; all are part of a 300-square-mile watershed contributing stream and drainage flows to the Charles River and eventually Boston Harbor once it passes through the Charles River Dam. The dam releases water from the Charles River and into Boston Harbor. The operation of the dam during severe weather events provides flood protection of properties as it lowers the elevation of the river by pumping water through to the Harbor.

FEMA is responsible for establishing flood zone locations and elevations or the height of water during certain flood events. FEMA publishes Flood Insurance Rate Maps showing flood hazard areas based on detailed studies and calculations. Flood Insurance Map 25025C0076G (dated September 25, 2009, panel 76 of 151), shows the flood zone within the Charles River east of the Project Area.

The FEMA mapped flood zone is defined as the 100-year flood event which represents a flood event that has a 1% probability of occurring in any given year. FEMA has determined that the river in the Project vicinity will rise to elevation 4.0 feet, North American Vertical Datum 1988 (NAVD88)[12] during the 100-year event. According to the FEMA Flood Insurance Study for Suffolk County, flood damage along the Charles River occurs when the water elevation approaches 3.8 feet. During the 100-year flood event, the dam operates pumps which maintain the water elevation at 3.5 feet, approximately 0.5 feet below the 100-year flood and 0.3 feet below the elevation which could cause potential damage to adjacent properties. The extent of the flood zone, shown as a blue shaded area on Graphic 4.12-2, shows the extent of the 100-year flood elevation confined within the river banks and not extending onto the adjacent PDW Path or SFR.

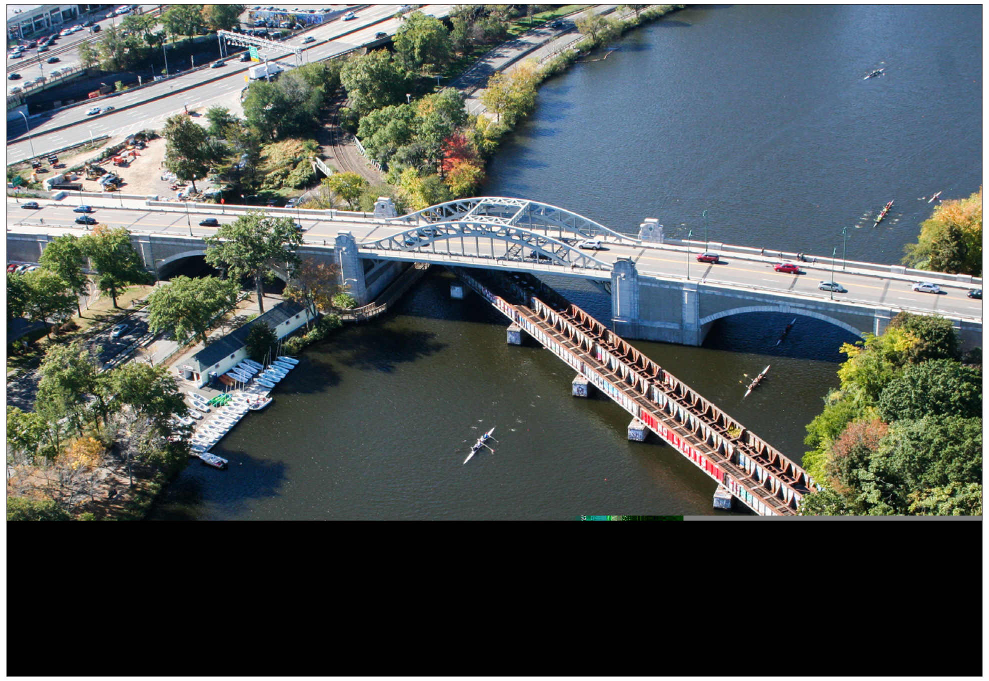
The Project Area ranges in elevation from 20 feet, (NAVD88) in the rail area and moving east toward SFR, it approaches elevation 10 feet NAVD88. The grassed area and PDW Path along SFR is elevation 8.5 feet, transitioning to elevation 7 feet along the top of the slope adjacent to the Charles River before it slopes down to the water. This means that during a 100-year flood, the river will not reach the roadway as it will be confined within the physical banks below the top of slope of the river.

4.14 Navigation

The Charles River is a navigable waterway that is well used by the public and local universities for sport, recreation, competitions and cultural festivals. The river is regularly used by powerboats, canoes, kayaks, sailboats, rowers, tour boats and paddle boarders.

The Charles River is relatively shallow within the Project Area, compared to the downstream area within the Charles River Basin. The water depth along the shore of the river ranges from 0 to 6 feet and gets deeper toward the center of the river, ranging from 8 to 11 feet. The only exceptions to this are at the bridge crossings. Deeper sections of the river are located in the vicinity of the River Street and BU Bridges where the depth is closer to 15 feet. In the vicinity of the River Street Bridge, the depth reaches 16 feet. Downstream, as it approaches the Charles River Basin, the river deepens to approximately 19 feet.

There are three bridge crossings of the river in the Project Area. From north to south, they include: River Street, GJR Bridge and the BU Bridge. The River Street Bridge connects River Street in Cambridge to Cambridge Street in Allston. The GJR Bridge is a single-track, railroad-only bridge passing under the BU Bridge. The BU Bridge connects Memorial Drive, Cambridge to Commonwealth Avenue, Brookline/Boston. The river ranges in width at each of these crossings from approximately 350 feet at the River Street and BU Bridge crossings, up to approximately 640 feet in width between the bridges in the immediate Project Area.



View of BU Bridge and GJR Bridge

There is one boat access location between the BU Bridge and River Street Bridge, the Riverside Boat Club, located on the east side of the river in Cambridge. Boat access immediately downstream of the BU Bridge includes the DeWolfe Boathouse (BU) and the Pierce Boathouse (MIT) on the north side of the river, and the public Sailing Pavilion on the south side. Upstream of River Street, boat access is from the Harvard Boathouse and various other boat houses further upstream. There are no boat ramps or access locations along the west side of the river in the Project Area between the River Street and BU Bridges.

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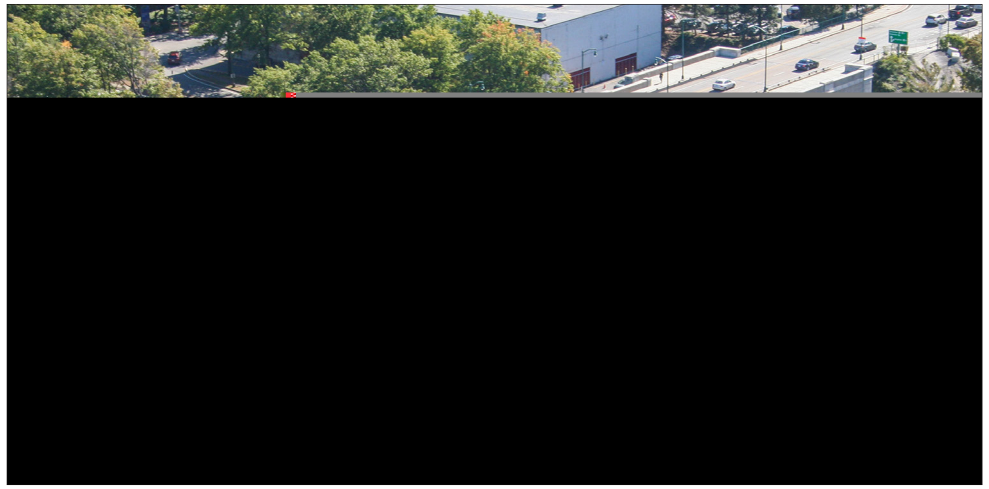
[12] Elevations referenced throughout the document are based on NAVD88.


[redacted]

View of BU Bridge looking Southeast

Tour boats frequent the river as well, entering from closer to Boston Harbor and running up to about Harvard Square in Cambridge. The speed limit for power vessels on the river is 6 miles per hour (mph) west of the BU Bridge, and as a basic rule, boaters must keep to the center of the river.

Scull boats (kayaks, canoes, stand-up paddleboards) specifically frequent the area west of the BU Bridge, and they keep to the outside (right) of the river wherever possible, crossing the center only to turn.

Every year the Head of the Charles Regatta is held in Boston on the Charles River. The event is the biggest two-day rowing race in the world, with more the 11,000 rowers and 300,000 spectators in attendance. The course starts at BU's Dewolfe Boathouse, just east of the BU Bridge, and continues 3 miles upstream just past the Eliot Bridge.

Sailing is another popular activity east of the BU Bridge where the river becomes deeper and wider, and where the bridges allow for additional clearance. As noted above, there is a sailing pavilion at the southeastern base of the BU Bridge, and as a result, the sport is enjoyed in the Lower Basin.

Charles River Dam

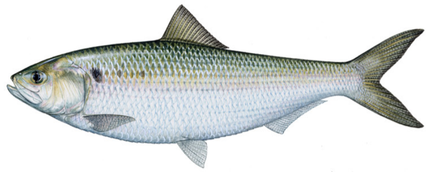
According to the USACE, the Charles River Dam is an earthfill and concrete dam with stone slope protection stretching between Boston and Charlestown. The dam sits just at the western edge of the Boston Inner Harbor and the eastern side of the Zakim Bridge. It provides tidal flood protection to urban property along the banks of the Charles River and improves commercial and recreational navigation. The elevation of the Charles River in the Project Area is managed by the operation of the New Charles River Dam.

The dam allows boaters to enter Boston Harbor from the Charles River and vice-versa, through the operation of three navigation locks for commercial and recreational vessels. Two of the locks, for small recreational craft, each measure 200 feet long, 22 feet wide, and eight feet deep. The third lock, 40-feet-wide, 300-feet-long and 17-feet-deep, accommodates commercial vessels, large recreational boats, and the overflow of small craft during peak days.

4.15 Fisheries

The Charles River contains many types of freshwater and saltwater fish due to its varied depths, vegetated shores and the shade provided by trees and bridges providing valuable habitat. The river is considered both an anadromous and catadromous fish run. Anadromous fish begin life in freshwater, then migrate to the ocean to spend the majority of their life. Eventually, they return to freshwater rivers or to the brackish upper reaches of estuaries to spawn and lay eggs. Then, in the autumn, most of the juveniles head back downstream to more brackish water. The fish rely on this section of the river to reach or migrate to freshwater habitat. Catadromous fish species begin life at sea and then migrate to freshwater, where they live for most of their adult lives. Eventually, they return to the ocean to spawn and die.

The anadromous fish found in the Charles River include the American Shad, Alewife Herring and the Blueback Herring. These fish enter the freshwater of the Charles River in the spring to spawn through the locks of the nearby Charles River Dam, which separates the freshwater river from the saltwater of Boston Harbor.



American Shad
(Alosa sapidissima)

Alewife Herring
(Alosa pseudoharengus)

According to the Charles River Watershed Association's 2014 publication, *Charles River Fish Field Guide*, the American Eel, a catadromous fish, is the second most abundant species found in the Charles River. The most common species counted in the mainstream portion of the river is the Bluegill. The species spawns in the river between April and September and maintains nests along the shore. The next most abundant species found in the river were the Redbreast Sunfish and Yellow Perch. Other species of notable count include Largemouth Bass, Pumpkinseed, Goldenshiner, White Perch, Common Carp and Black Crappie.

Water depths in the Charles River vary. Areas surrounding the River Street and BU Bridges are slightly deeper and coupled with overhangs, bridge pier and trees. These areas provide optimum habitat for many species with deep pools, shade and cooler water temperatures. The river is widely used for recreational fishing.

4.16 Threatened and Endangered Species

The Massachusetts Natural Heritage and Endangered Species Program (NHESP) of the Massachusetts Division of Fisheries and Wildlife protects endangered and threatened species in the Commonwealth. The United States Fish and Wildlife Service (USFWS) protects endangered and threatened species nationwide.

4.16.1 Massachusetts Endangered Species Act

Under the Massachusetts Endangered Species Act (321 CMR 10.00) (MESA), NHESP identifies a species as "endangered" as any species of plant or animal in danger of extinction throughout all or a significant portion of its range and species of plants or animals in danger of extirpation, where the species no longer survives in regions that were once part of its range, but that still exists elsewhere in the wild or in captivity.

A "threatened" species is listed as any species of plant or animal likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range and any species declining or rare as determined by biological research and inventory and likely to become endangered in the foreseeable future.

NHESP also has a third category which they identify as "special concern." A species of "special concern" is any species of plant or animal which has been documented by biological research and inventory to have suffered a decline that could threaten the species if allowed to continue unchecked or that occurs in such small numbers or with such a restricted distribution or specialized habitat requirements that it could easily become threatened within Massachusetts.

The NHESP publishes maps and lists of protected species for each town. According to the list and map, the Piping Plover is a threatened species in Boston. A review of the maps indicates that there are no state mapped priority or estimated habitats for threatened or endangered species in the Project Area.

4.16.2 Federal Endangered Species Act

The Endangered Species Act of 1973 (ESA) protects and recovers imperiled species and the ecosystems upon which they depend. It is administered by the USFWS and the Commerce Department's National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine wildlife such as whales and anadromous fish such as salmon.

The ESA defines endangered as "the classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range." It defines threatened as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."

The presence or absence of species, including plants, animals and birds, is determined by reviewing federal and state databases and conducting field surveys if the likelihood of a species may be present in the Project Area. The USFWS's New England Field Office publishes a list of species for Massachusetts by county. According to the Massachusetts list, there are three federally listed species found in Suffolk County; namely, the Piping Plover, Red Knot and the Northern Long-eared Bat. The Plover and Red Knot are both found in coastal beach habitats along the shore and would not be found within the Project Area. The Northern Long-eared Bat habitat is limited to mines, caves and forested areas, none of which occur within the Project Area.

Confirmation as to the presence or absence of the species will be made directly through the New England Field Office of the USFWS.

4.17 Stormwater Management

Stormwater

Stormwater runoff results from rainfall and snow melt flowing over the ground surface where the resulting water does not soak into the soil. In developed areas, runoff is typically managed by capturing it with open grates or catch basins and conveying it through underground pipes to a downstream wetland or waterway. Development projects typically result in the addition of impervious surfaces, such as pavement and concrete, where the runoff does not enter the ground surface. Runoff from pavement often contains pollutants such as oil/grease, metals and nutrients. Runoff generated from new roadway surfaces must be properly managed so it does not alter natural features, increase the rate and amount of flow to receiving waters, or increase the discharge of pollutants to wetlands and water bodies.

The predominant land use within the Project Area is transportation, including rail and highway infrastructure, followed by commercial use, single, two- and three-family high density residential development and open land. Stormwater runoff from the Project Area flows to the Charles River, with nearly all of it captured by catch basins or similar structures and conveyed entirely through underground pipes or the Municipal Separate Storm Sewer System (MS4) systems that outlet or discharge along the westerly bank of the Charles River. The existing drainage systems and discharge locations are shown in Figure 4.17-1. The contributing watershed areas are shown on Figure 4.17-2.

Overview of Pollutants

As runoff flows over the pavement or other impervious surfaces, it comes into contact with various pollutants found on urban roadways. Typical pollutants include oil and grease from vehicles; nutrients such as phosphorous from fertilizer, leaves, grass; bacteria from migrant bird populations and pet waste; and metals from roofs, gutters and downspouts. Air pollution, or atmospheric desposition, can also contribute pollutants such as nutrients, PCBs and heavy metals. Pollutant sources within the rail yard surface include car and truck tail-pipe emissions and fluids, train engines and fluids, aerial depositions and trash.

New or more current stormwater management systems typically have in-line treatment devices or practices to reduce the amount of pollutants in the stormwater prior to discharge to wetlands or waterways. The majority of the existing pipe networks discharging to the Charles River in the Project vicinity provide a minimal level of treatment of pollutants prior to discharge, since they were constructed well before current stormwater quality regulations were enacted.

Impervious cover directly contributes to water quality impairments of downstream receiving waters. Urbanization over time has resulted in increased sediment and pollutant loads in receiving waters as well as increased peak rates of runoff that can cause scour and erosion downstream. The percentage of existing impervious cover within the Project Area is 56%. The distribution of impervious and pervious cover within the Project Area is shown in Table 4.17-1.

Table 4.17-1: Project Area Pervious and Impervious Land Cover

Cover Type	Acres
Impervious (pavement and roofs)	78.4
Pervious (including vegetated areas)	62.8
Total Acres	**141.2**

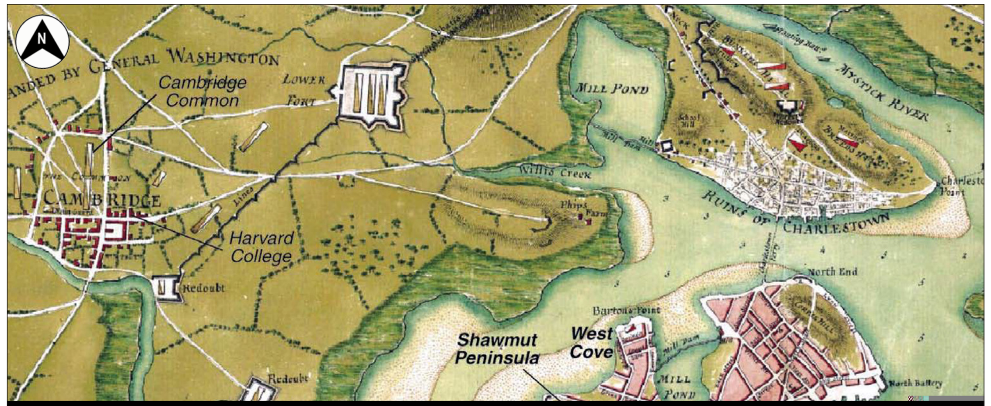
Charles River

The land area contributing stormwater runoff to the Charles River or its "watershed" encompasses 311 square miles, of which 40 square miles contributes to the Project segment referred to as the "Lower Charles River." The Lower Charles River extends from the Watertown Dam to the Charles River Dam. Beyond the dam, the freshwater Charles River empties to Boston Harbor.

Salt Creek (a.k.a Smelt Brook)

The Salt Creek Culvert flows beneath the rail yard area and consists of a 7.5-foot by 7-foot concrete box culvert. The 7.5-foot by 7-foot concrete culvert conveys an underground waterway (Salt Creek), built in 1909 by the Boston Public Works Department. The culvert collects stormwater from an approximate 500-acre watershed from Brighton and Brookline, flows north under BPY to a manhole in the yard, and then turns to the northeast.

According to the Massachusetts Turnpike Authority, Boston Extension Section No. C-2 Grading and Drainage Plan Sheet HC2-33, the culvert connects to a large oil and grit separator prior to discharging into the Charles River. The entirety of the Salt Creek Culvert is owned and maintained by BWSC. Other entities, specifically MassDOT, MBTA and Harvard, connect some sections of their drainage systems to the Salt Creek Culvert.



Historic plan of Smelt Brook

4.17.1 Stormwater Management System Operators

In the Project Area, stormwater runoff is transported through MS4s and discharged to the Charles River. An MS4 is a conveyance or system of conveyances (e.g., storm drains, pipes, ditches) owned by a state, city, town or other public entity that discharges stormwater to waters of the United States. The MS4 operators responsible for the operation and maintenance of the storm drain system include MassDOT, the MBTA, the City of Boston (via the BWSC), the DCR and Harvard University.

MassDOT Highway Components

I-90 Interchange

The stormwater management system for MassDOT's existing at-grade section of I-90, the former toll plaza areas, and the interchange ramps, includes catch basins that drain to large pipes (trunk lines) increasing in size proceeding west to east, culminating in a single 84-inch diameter pipe at a junction structure just west of SFR. Additionally, a portion of MassDOT's interchange loop ramps and infield area located north of Cambridge Street drain to a MassDOT subsurface pump station (Pump Station No. 1) that is situated within the loop ramp's paved infield. From the pump station, drainage is conveyed under pressure, out of the infield area to a manhole junction just beyond the outside edge (northwest) of the loop ramps. Drain pipes from areas to the north and west under Harvard University jurisdiction also enter this manhole junction. From this manhole, twin 36-inch diameter pipes convey drainage by gravity to the south, to a junction with MassDOT's 84-inch diameter main interchange drainage trunk line. At the junction, the upstream 84-inch diameter pipe splits into three 42-inch diameter downstream pipes that pass under SFR to discharge into the Charles River. These discharge pipes into the Charles River are owned and maintained by MassDOT. The MassDOT drainage system was constructed in the 1960s as a separated drainage system and no part of the drainage system has connections from sanitary sewer lines. The existing system does not include water quality Best Management Practices (BMPs).

Typical storm drain inlet along I-90

I-90 Viaduct

The original viaduct drainage system conveyed stormwater from the viaduct surface to grated drain inlets, or scuppers, to drain pipes attached to the viaduct support columns (similar to gutters) to underground drainage structures. The underground system then conveyed stormwater to either the Salt Creek Culvert to the west or to the stormwater pump station (Pump Station No. 2) to the east, near the easterly abutment. Currently, the drain pipes no longer connect to underground structures, but terminate at the base of the columns, with stormwater dropping directly to the ground and flowing overland to the Charles River.

A portion of the interchange and the westerly section of the viaduct drain to an oil separator structure that connects to the BWSC-owned Salt Creek Culvert. The most easterly section of the viaduct drains to a MassDOT pump station (Pump Station No. 2) that is located under the viaduct west of the easterly viaduct abutment. From the pump station, MassDOT's outlet pipes, a 30-inch force main and a 6-inch force main, connect to a BWSC junction structure that is located between SFR and the Charles River. A 5-foot by 7-foot concrete box culvert conveys drainage from this junction to a BWSC discharge point (BWSC designation 23G132) at the Charles River.

Salt Creek Culvert as it flows beneath SFR with floating boom and silt curtain

MBTA/CSX

Rail Yard

As previously discussed, the rail yard has been in use since the 19th century. Consistent with other railroad yards constructed in this time period, the existing ballasted tracks were likely constructed with underdrains that collected stormwater and discharge to a stream culvert east of the rail yard. Stormwater from paved portions of the northern area of the rail yard is currently collected in a series of catch basins and is believed to be connected to the Salt Creek Culvert. As the landowner, Harvard is responsible for the drainage system located in the rail yard. A video inspection of Salt Creek on November 10, 2015 noted no major defects.

At the west end of the rail yard, the stormwater runoff between the railroad tracks west of the Cambridge Street Bridge is collected within swales and conveyed to catch basins. The catch basins tie into the I-90 drainage system.

Based on existing aerial survey, no surface stormwater detention systems are in place in the rail yard. Landcover within the yard is predominantly track ballast, which is a crushed stone track bed. Consistent with other rail yards constructed in the same period, it is believed that the ballast is between 12 to 15 inches in depth on an 8-inch sub-ballast. This substrate is highly pervious.

Worcester Main Line

The Worcester Main Line is believed to have an underdrain for stormwater conveyance. The ROW is comprised predominantly of railroad ballast, which infiltrates stormwater.

Typical outfall into Charles River

City of Boston

Cambridge Street

BWSC owns and operates the Cambridge Street drainage system. The system is comprised of catch basins and trunk lines of various sizes that flow west to east within the street layout, culminating within a 30-inch by 36-inch line to a manhole junction at the River Street intersection. From this manhole, a 36-inch trunk line carries drainage south under the Entrance Road to SFR to a manhole with a tide gate opposite the main entrance to 400 SFR. The 36-inch pipe then continues southeast, crossing SFR to the Charles River discharge point (BWSC designation 24G034). The discharge pipe to the Charles River is submerged and its location is approximate based on record plans.

Stormwater quality is regulated at the federal, state and local levels.

DCR

Soldiers Field Road

The SFR drainage system falls under the jurisdiction of the DCR. This system is comprised of small roadway contributing areas or "subcatchments" that drain through one or two catch basins to small diameter outlet pipes discharging directly into the Charles River. The system includes a total of 24 separate points of discharge, some of which are submerged completely or partially or located below the mean annual flow elevation of the river. The discharge pipes do not include velocity dissipation aprons, such as stone armoring, but no significant bank erosion and resulting sedimentation was observed at the point of discharge locations. The DCR system does not include any pretreatment of stormwater prior to discharge into the Charles River.

4.17.2 Regulations and Water Quality

Federal Regulations

TMDL and 303(d) Program

The U.S. EPA requires states to establish priority rankings for waters and develop Total Maximum Daily Loads (TMDLs) for these waters under section 303(d) of the Clean Water Act to address pollution from point and non-point source discharges. TMDLs represent a pollution budget that establishes the maximum amount of a pollutant that can occur in a waterbody and still meet Massachusetts Water Quality Standards (WQS). States are required to submit lists of impaired waters to the U.S. EPA for approval. “Impaired” status means that the waterway does not meet state WQS. These are waters that are too polluted or otherwise degraded to meet WQS, and once approved under the 303(d) program, the state then continues to study and test the waterway and if the quality degrades further, then eventually a TMDL is developed for a specific pollutant. A TMDL serves as a planning tool and potential starting point for restoration or protection activities with the ultimate goal of attaining or maintaining WQS.

- *303(d) Listed Impairment in the Charles River.* According to the Massachusetts Year 2014 Integrated List of Waters by the Massachusetts Department of Environmental Protection (MassDEP), the segment of the Charles River in the Project vicinity, identified as MA72-36, is listed as impaired for chlorophyll-a, DDT (chemical pesticide), escherichia coli, fishes bioassessments, nutrient/eutrophication biological indicators, oil and grease, dissolved oxygen, PCB in fish tissue, high pH, total phosphorous, secchi disk transparency, sediment bioassays-acute toxicity freshwater, and others.
- *TMDLs in the Charles River.* There are two TMDLs that apply to the segment of the Charles River within the Project vicinity: the Final TMDL for Pathogen TMDL dated June 2007 and the Final TMDL for Nutrients in the Lower Charles River Basin Watershed dated June 2007.

Pathogen TMDL

The Final Pathogen TMDL for the Charles River Watershed indicates that the source for pathogens in the Project vicinity is bacteria and fecal-related pollution, where the majority of the pollutant is from illicit sewer connections to storm drains; combined sewer overflows (CSOs); and urban stormwater runoff that contains pet and/or animal waste. Overland sheet flow carries fecal waste from birds and pet waste. Since the establishment of the Final Pathogen TMDL for the Charles River Watershed dated January 2007, tremendous strides have been made to eliminate CSOs and illicit discharges, the greatest source of pathogen loading. According to U.S. EPA’s Charles River Initiative web site, the Charles River Initiative has reduced 99% of CSO discharges to the Lower Charles River between 1988 and 2014. According to the BWSC, there are no CSO discharges in the Project Area.

The MA WQS also set criteria for fecal coliform, which state that the geometric mean of a representative set of fecal coliform samples shall not exceed 200 colonies per 100 milliliters and no more than 10% of the samples shall exceed 400 colonies per 100 milliliters. The MassDEP may apply these standards on a seasonal basis. The TMDL document analyzed and calculated the percent of pathogen reductions required to meet WQS for each segment of the river. In the Lower Charles River, identified in the TMDL document as segment MA 72-08, the target reduction for pathogens is 99.5%.

Nutrient TMDL

The Final TMDL for Nutrients in the Lower Charles River Basin states that nutrients are causing excessive algae growth, with phosphorus identified as the primary pollutant of concern that contributes most to the algae growth. The majority of the pollutant enters the river through overland stormwater runoff and piped drainage systems, illicit sanitary sewer discharges, fertilizers, CSOs, and discharges from wastewater treatment plants.

Water quality modeling was performed to determine the acceptable algae level (chlorophyll-*a*) and allowable nutrient loadings in the Lower Charles River based on contributing watershed sources. The seasonal average concentration of chlorophyll-*a* of 10 micrograms/liter was determined to be an acceptable level that enables the Lower Charles River to meet all Class B criteria established by the WQS for nutrients, aesthetics, clarity, dissolved oxygen and pH.

Source Reduction Approach to Address Pathogens

Pathogen loading in the roadway setting can be highly variable, and is not considered a primary source of pathogen loading to waterbodies (CSOs, Title V systems, etc.) therefore structural BMPs will not be implemented specifically to reduce pathogen loads to the Charles River or meet the WLA stipulated in the TMDL. However, the infiltration practices proposed in each alternative are given a 90% reduction credit in pathogens concentrations in stormwater.

Significant pathogen reduction is achieved by implementing non-structural BMPs, including source controls and reductions, education programs and the elimination of illicit connections. BWSC, DCR and MassDOT implement non-structural BMP programs.

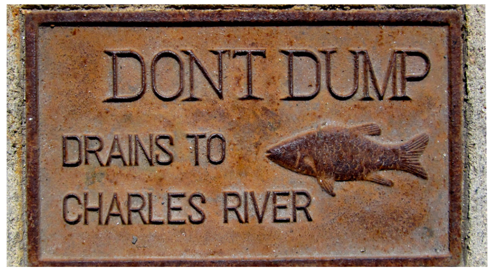
Watershed Based Approach to Address Phosphorous (Nutrients)

In lieu of implementing numeric effluent limitations for stormwater discharges to meet the TMDL, the U.S. EPA prepared a phosphorous loading analysis based on land cover for the entire Charles River Watershed in an effort to understand the reductions necessary to meet WQS. Since land cover directly influences the amount of phosphorous generated and discharged, estimated loadings based on land cover were analyzed. The TMDL loading for phosphorus in the Lower Charles River from stormwater was determined from land use categories and expressed for the entire watershed and by community.

The amount of impervious cover is directly proportional to higher phosphorous loading where there is limited opportunity to filter pollutants prior to discharge through soils and vegetation. Annual phosphorous loading for land cover for each community was calculated, with Boston requiring a 64% reduction to meet WQS. This reduction provides general guidance as an overall watershed based approach for each community to achieve and maintain WQS. Table 4.17-2 provides Land Cover Area and Annual Phosphorous Loadings for the City of Boston.

Table 4.17-2: Land Cover & Annual Phosphorous Loadings for Boston

Land Use	Drainange Area (acres)	1998-2002 Loading (kg/yr)	TMDL Loading (kg/yr)
Commercial (within Project Area)	1,451	996.4	343.7
Industrial (within Project Area)	1,337	796.4	274.7
High Density Residential	5,576	2,892.4	997.6
Medium Density Residential	107	24.6	8.5
Low Density Residential	50	0.9	0.5
Agriculture	18	3.7	2.4
Forest	1,700	89.7	89.7
Open Land	3,568	49.6	32.0
Total	**14,550**	**4,853**	**1,749.04**
		Percent Reduction Required	**64%**



Municipal Separate Storm Sewer System Program

The MS4 owners operate their stormwater management systems in accordance with permits issued by the U.S. EPA under the National Pollutant Discharge Elimination System (NPDES) program where they are required to develop and implement stormwater management programs (SWMPs) for their respective stormwater discharges.

Coverage under the U.S. EPA’s Multi-Sector General Permit is required for certain industrial activities. In the Project Area, CSX operations are covered under the NPDES MSGP (Permit No. MA0025704), which remains in effect through October 31, 2019. The schedules outlined in the permit take into account the ongoing process of transferring the transportation easement from CSX to the new operators of the site. The permit includes discharge limitations and monitoring requirements for TSS, oil and grease, and various other effluent characteristics. Limits are also placed on the rate of flow of stormwater discharging from the Project Area to the Charles River.

Construction General Permit

Construction-term stormwater discharges may contain pollutants including sediment, oil, grease and construction related waste; said discharges require coverage under the U.S. EPA’s NPDES Construction General Permit for Stormwater Discharges from Construction Activities. For projects disturbing one or more acres of land where discharges enter a Water of the U.S., permit coverage is required. A Stormwater Pollution Prevention Plan (SWPPP), including project specific erosion and pollution prevention and sediment control measures, must be prepared and implemented by the contractor. The conditions of the permit require performing regular inspections and preparing inspection forms.

State Regulations

The Massachusetts Surface Water Standards classify surface waters in the state and establish minimum criteria to protect and enhance uses. The state regulations classify the Lower Charles River segment in the Project Area as an inland Class B waterway with warm water fishery and combined sewer overflow qualifiers. Class B waters include designated uses as habitat for fish, other aquatic life and wildlife, as well as for primary and secondary contact recreation. The WQS set criteria to sustain the listed designated uses for discharges of potential pollutants, including dissolved oxygen, pH, solids, color and turbidity, aesthetics and nutrients.

At the state level, the management of stormwater and associated water quality is regulated under the MassDEP Stormwater Management Standards and the Massachusetts Surface Water Quality Regulations. The MassDEP Stormwater Management Standards are part of the Massachusetts Wetlands Protection Act, locally administered by the Boston Conservation Commission.

The following standards must be met under the MassDEP Wetlands Protection Act. Chapter 5.17 discusses how the Project meets the standards.

Standard 1 – No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

Standard 2 – Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

Standard 3 – Loss of annual recharge to ground water shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices and good operation and maintenance. At a minimum, the annual recharge from the post development site shall approximate the annual recharge from the pre-development conditions based on soil type.

Standard 4 – Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of TSS. This standard is met when:

- Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan and thereafter are implemented and maintained;
- Structural stormwater BMPs are sized to capture the required water quality volume in accordance with the Massachusetts Stormwater Handbook; and
- Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.

Standard 5 – For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention, all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such use as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26 through 53, and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

Standard 6 – Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such area as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area, if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A “storm water discharge” as defined in 314 CMR 3.04(2) (a) 1. or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited, unless essential to the operation of the public water supply.

Standard 7 – A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5 and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

Standard 8 – A plan to control construction related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation and pollution prevention plan) shall be developed and implemented.

Standard 9 – A long-term operation and maintenance plan shall be developed and implemented to ensure that the stormwater management system functions as designed.

Standard 10 – All illicit discharges to the stormwater management system are prohibited.

4.18 Utilities

The Project Area includes a multitude of existing utilities including water, sewer, gas, electric power and communications. Some of the utilities are located within roadway ROWs while others traverse the Project Area in easements outside of roadways. Utility easements include rights for the utility owners to access the land to repair, maintain and upgrade their infrastructure. Within the interchange area there is one overhead utility pole line carrying power through BPY roughly following the curvature of I-90. Adjacent streets, particularly north of Cambridge Street, also include utility poles. All other utilities, except those carried by bridges, are underground.

Cambridge Street, Franklin Street, and an area along a section of the southerly boundary of the Project along the commuter rail tracks comprise the densest concentration of underground utilities in the Project Area and include electrical power transmission and distribution lines, gas transmission and distribution lines, telecommunication lines, water and sewer mains, and drainage trunk lines. The utility companies and public and private utility agencies having facilities in these locations and elsewhere in the Project include:

- MWRA (water and sewer)
- BWSC (water, sewer, storm drain)
- DCR (street lighting, storm drain)
- National Grid (gas)
- Eversource (electrical power transmission and distribution)
- Verizon Business, AT&T, Level 3, Williams Communications Group, and Sprint (communications)
- MassDOT (highway lighting, storm drain, communications)
- MBTA maintains power, signal and communication lines for the commuter rail tracks as part of rail operations

Figure 4.18-1 shows the major utilities in the Project Area, including MWRA’s 7-mile-long, 10-foot diameter City Tunnel Extension, running between Shaft 7 in Chestnut Hill to Shaft 8 off the southeast corner of the intersection at Western Avenue and SFR, lies approximately 300 feet underground and roughly 150 to 200 feet below bedrock in an alignment generally north of Cambridge Street, but crossing under I-90 at the Cambridge Street Bridge. The tunnel, built in 1963, carries water through Brighton to Cambridge, Somerville, and Medford, ending at the Malden line. Several other large MWRA sewer and water lines cross through the interchange in easements, but at more shallow depths.

The existing I-90 viaduct supports communication facilities shown on Figure 4.18-2 including communication facilities comprised of 4-8-inch high-density polyethylene (HDPE) conduits carrying fiber optic cable that are supported for the entire length of the viaduct and then transition to an underground installation at the northerly viaduct abutment. The system runs underground northerly to an alignment south of Cambridge Street, continuing in a westerly direction to the north of the I-90 westbound shoulder out of the Project Area. Level 3, Verizon Business, AT&T, Williams Communication Group and MassDOT either own or lease conduit and fiber within the system. Level 3 is the system owner.

Typical utility trench

Sprint owns a communication duct that is in the southernmost Project Area, predominantly adjacent or passing under the existing MBTA commuter rail tracks. Their facilities traverse the entire length of the project along the track alignment, following Track 2 of the Worcester Main Line through the Project Area. The fiber line is housed in a 1.25-inch HDPE duct. The duct is protected within 4-inch iron pipe sleeves at rail crossings. RCN and Comcast communication lines also border adjacent streets.

The pedestrian bridge west of the Cambridge Street Bridge carries multiple electric power conduits within its single bay. On the deck, the anti-missile fence supports pedestrian light fixtures.

The former Franklin Street ROW crossing I-90 and on each side of I-90, to the west of the existing pedestrian bridge, is densely occupied by utilities including a 48-inch diameter MWRA water line, multiple electric power and communication duct banks and conduits, and two large gas lines.

The Cambridge Street Bridge over I-90 has 12 bays, five of which are occupied by utilities: a 24-inch diameter and two 30-inch diameter gas mains, a 12-inch water main, and a communication duct bank.

Eversource provides electric services including transmission and distribution infrastructure within the Project Area. There is adequate power and electrical services present in the Project Area, with multiple service points throughout. There is also an Eversource substation at Lincoln Street with major services traversing the Worcester Main Line ROW and toward the Cambridge Street/ Lincoln Street intersection.

Verizon provides telephone services in the Project Area with conduits throughout.

4.19 Climate Change

The climate of a region or city is its typical or average weather, and climate change is a change in this typical or average weather. This could be a change in a region's average annual rainfall or it could be a change in a city's average temperature for a given month or season. Global climate change is a change in Earth's overall climate. This could be a rise in the average surface temperatures on Earth, also referred to as global warming, or it could be a change in the Earth's typical precipitation patterns.

Climate-related hazards are predicted to pose increasing threats to the viability and resiliency of infrastructure. The *National Climate Assessment* (Horton et al., 2014) specifies sea level rise, coastal flooding and intense precipitation events as the primary climate stressors for infrastructure in the Northeast. As global temperatures rise, thermal expansion and melting polar ice will contribute to eustatic sea level rise (compounded by local isostatic change). Eustatic sea level changes occur on an oceanic to worldwide scale. They result from either a change in the volume of seawater, or a change in the size of the ocean basin that contains it. Isostatic sea level change is the result of an increase or decrease in the height of the land. When the height of the land increases, the sea level falls and when the height of the land decreases the sea level rises. Isostatic change is a local sea level change whereas eustatic change is a global sea level change. Tropical and extra-tropical storms will become more frequent and more intense, and extreme precipitation will become more common as a result of climate change. Tropical storms are low-pressure systems with activity like thunder and lightning that develop in the tropics or subtropics. Stronger tropical systems are called "hurricanes" or "typhoons," depending on where they form. Weaker tropical cyclones might be called "tropical depressions" or "tropical storms." Extratropical storms, such as Nor'easters and blizzards, have cold air at their core and derive their energy from the release of potential energy when cold and warm air masses interact.

These potential climate related impacts are highly relevant to Boston, and specifically to the Project, which lies directly adjacent to the Charles River. Therefore, the focus of this climate change vulnerability assessment is the potential exposure of the Project Area to flooding due to the changing climate conditions. This section focuses on the pre-project conditions associated with the changing climate at the proposed I-90 Allston Interchange area along the Charles River.

The *National Climate Assessment* also projects that as global temperatures rise, the frequency, intensity, and duration of heat waves will increase. In the urban context, and especially in transportation corridors such as the proposed Project Area, rising temperatures and heat waves compound the urban heat island effect. The term "heat island" describes built up areas that are hotter than nearby rural areas. This climate change vulnerability assessment also addresses the potential contribution of paved surfaces in the Project Area to the urban heat island effect.

4.19.1 Modeling Climate Induced Inundation

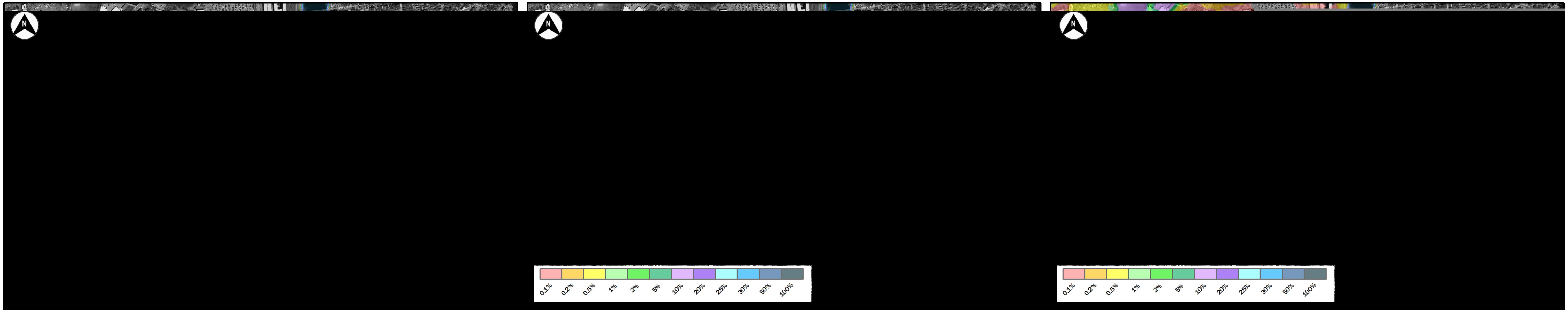
Following Hurricane Sandy, MassDOT had growing concerns related to sea level rise and extreme storm events impacting the greater Boston transportation network. In 2015, MassDOT, in concert with the FHWA, completed a comprehensive Pilot Project assessing impacts due to sea level rise and extreme storm events within the vicinity of the Boston Harbor: *Climate Change and Extreme Weather Vulnerability Assessments and Adaptation Options for the Central Artery* (Bosma et al., 2015). For this project, MassDOT developed a high resolution hydrodynamic model to assess exposure of the Central Artery/Tunnel Project (CA/T) to sea level rise (SLR) and extreme storm events under a range of climate scenarios. A hydrodynamic model is a tool used to describe or represent in some way the motion of water. The sophisticated model included the river networks (Neponset, Charles, Mystic) in the Boston area and the interaction of sea level rise, storm surge, river discharge and dam operations. This includes detailed information at the proposed I-90 Allston Interchange site. As such, the analysis presented herein relies on the MassDOT hydrodynamic model and those results, which represent the latest and most comprehensive assessment of future flood risk for the area.

The Boston Harbor Flood Risk Model (BH-FRM) is a hydrodynamic model based on mathematical representations of the processes that affect coastal water levels such as riverine flows, tides, waves, winds, storm surge, sea level rise and wave set-up, which features a fine enough resolution to identify site-specific locations that may require adaptation alternatives. BH-FRM tightly couples the ADvanced CIRCulation model's (ADCIRC) predictions of storm surge inundation with the unstructured version of Simulating WAves Nearshore (UNSWAN) model's prediction of storm-induced waves. Complete details on the MassDOT/FHWA project and the model itself are presented in Bosma et al. (2015).

A key aspect of potential flooding in Boston includes the influence of the Charles River running through the city and discharging into Boston Harbor. The Charles River was included in the model to evaluate the combined impact of watershed discharge and storm surge based flooding. BH-FRM also simulates flow conditions under storm scenarios (dam closure and pumping) at the New Charles River Dam. A hydrograph is a graph of the flow in a stream over a period of time. River discharge hydrographs for present and future climate conditions are integrated in the model, allowing for the assessment of pumping operations in managing upstream water levels. In all storm cases for all year scenarios, BH-FRM applies a 100-year, 24-hour discharge hydrograph to the Charles River and conservatively aligns this discharge with the peak storm surge.

BH-FRM utilizes present day and projected return period rainfall event precipitation totals (e.g. 100-year, 24-hour rainfall event for 2030), developed by Kleinfelder (2014) for the City of Cambridge's climate change vulnerability assessment, to develop river discharge hydrographs using watershed and river modeling for present day and future climate change conditions. The Charles River discharge data were provided by MWH Global (2014) and included all contributors combined (Cambridge, MWRA overflows south and north of the Charles, Watertown and Newton) to arrive at the peak flows and discharge hydrographs.

Graphic 4.19-1 BH-FRM Coastal Flood Excedance Probability



Present

2030

2070

It is important to consider that, although BH-FRM accounts for increased Charles River discharge due to climate induced increases in precipitation and overbank flooding, the model does not include precipitation based flooding in the Study Area from upland sources (i.e. stormwater runoff). In other words, BH-FRM does not include potential backups in piped infrastructure, or poor drainage conditions at a specific site. Since precipitation is projected to increase with climate change, these stormwater flooding impacts are also expected to intensify.

As articulated in the model, the New Charles River Dam is managed to maintain the upstream basin between elevations of 106.5 and 108.5 feet (Metropolitan District Commission [MDC] Datum equals 0.05 to 2.05 NAVD88 datum), so the pumps are generally activated to maintain these levels. There are a total of six pumps. Practically, three pumps are activated when the operator perceives the water level will exceed elevation 108 (MDC Datum= 1.55 NAVD88), and all six can be activated as needed per the operational guidance. Each pump has a capacity of 1,400 cfs. When a storm is in the forecast, pumps also are activated to proactively reduce the water level in the river to accommodate increased discharge storm waters.

Along with the increased discharge conditions, the BH-FRM model also includes projected sea level rise and dynamic storm surge conditions in Boston Harbor. Currently, the BH-FRM model brackets SLR scenarios for three distinct time periods (Present, 2030, 2070) and makes adjustments for local subsidence. For coastal storms, BH-FRM utilizes a Monte Carlo statistical approach, based on large sets of historical and synthetic water levels from hurricanes and Nor'easters, to estimate the composite (SLR, storm surge, river discharge) probability of flooding throughout the Boston Harbor region. The composite probability of flooding is the chance that a given location in the model will be inundated at least once in any given year under the assumed climate scenario. These inundation probabilities allow asset managers and planners to incorporate risk tolerance into vulnerability assessments, and develop appropriate and strategic adaptation interventions.

4.19.2 Inundation Vulnerability – Present and 2030

The BH-FRM results for present day conditions (Graphic 4.19-1) predict no chance of flooding in the Project Area outside of the banks of the Charles River. This finding is consistent with current FEMA analyses (see Section 4.13 Floodplain), which concluded that the current 100-year flood discharge can be accommodated by the New Charles River Dam pumping operations such that the water surface elevation will not rise above elevation 4 (NAVD88) and will therefore not crest the banks of the Charles River.

The BH-FRM results for 2030 conditions also predict no chance of flooding in the Project Area outside of the banks of the Charles River. BH-FRM results indicate that, unless the dams are flanked or overtopped due to coastal storms (or otherwise rendered non-functional), the existing pump systems are able to adequately handle expected increases in river discharge due to climate change conditions. The model uses a projected 2030 peak flow of up to 2,615 cfs to represent near term future rainfall discharge flow for the Charles River (the 100-year, 24-hour present day peak flow is 2,395 cfs).

4.19.3 Inundation Vulnerability – 2070

Predicted storm surge inundation from Boston Harbor in the BH-FRM 2070 scenario flanks and overtops the New Charles River Dam, rendering the dam's pumps ineffective at removing the combined storm surge volume and Charles River discharge from the basin out to the harbor. The model uses a projected 2070 peak flow of up to 2,869 cfs to represent long term future rainfall discharge flow for the Charles River. Although these peak flows do not exceed the pumping capacity of the New Charles River Dam (8,400 cfs), storm surge induced flanking and overtopping of the dam far exceeds the capacity of the pumps and causes water to flow upstream behind the dam throughout the Charles River system.

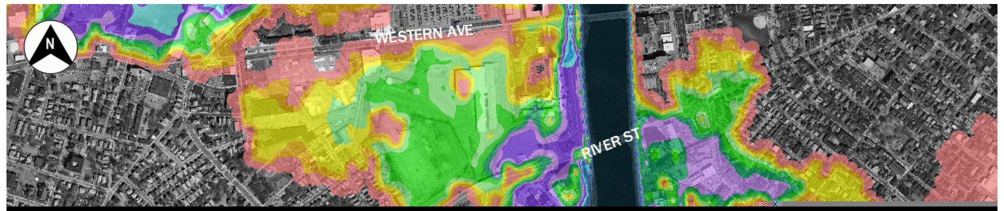
The BH-FRM results (Graphic 4.19-1) for 2070 conditions predict a 0.1% to 1% (1000-year to 100-year flood levels) chance flooding in the Project Area outside of the banks of the Charles River based on existing conditions. Flooding is predicted primarily between the railyard south of River Street north to Western Avenue, extending as far west as Travis Street. Additional smaller areas of inundation occur along SFR and the PDW Path (north of BU's Nickerson Field, and north of BU's College of General Studies). Flooding in 2070 does not threaten I-90 until the highway meets grade near the BU Bridge. The 2070 maximum water surface elevation (0.1% probability level) in the Charles River is 11.1 feet NAVD88, which is above the road surface elevation for SFR but well below the I-90 viaduct.

The 2070 0.1% inundation depth (Graphic 4.19-2) of flooding associated with approximately the 1000-year water surface elevation in 2070) in the Project Area ranges between 4 and 5 feet along SFR between River Street and Western Avenue, and generally between 1.5 and 2.5 feet across the open areas west to Travis Street. The 0.1% inundation depth ranges between 1.5 and 3.5 along SFR in the BU vicinity.

At the 1% probability level (approximately the 100-year water surface elevation) in 2070, there is very little flooding from the Charles River in the Project Area. Limited flooding occurs along a 350 foot span of SFR and the shared use path to the northeast of the railyard. The 1% inundation depth (Graphic 4.19-3) is approximately 2 feet in this section.

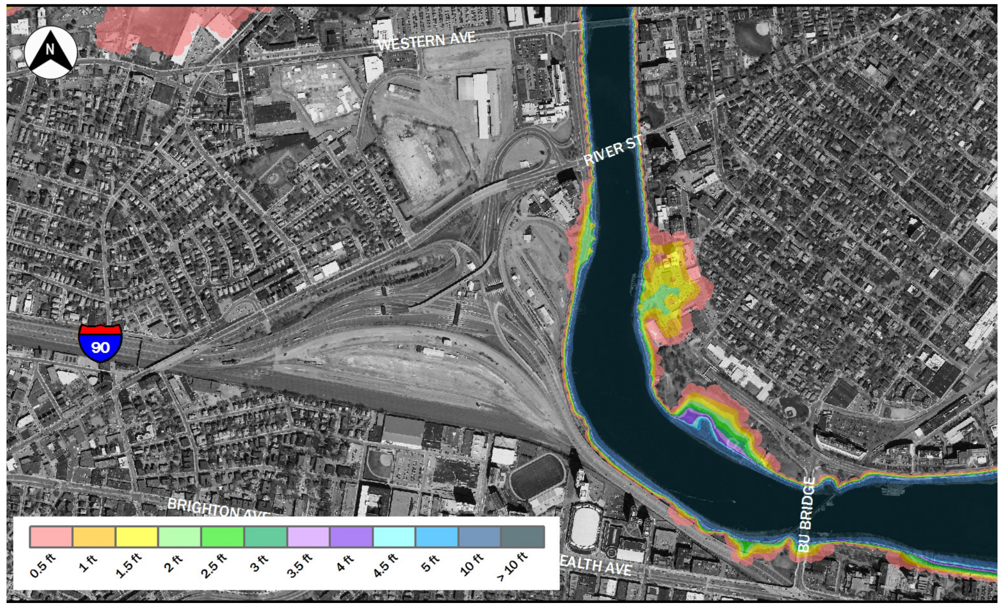
While model results are projected in BH-FRM for 2070, flanking and overtopping of the New Charles River Dam, and subsequent upstream flooding, may occur prior to 2070. Interpolation of model results predicts that at the 0.2% risk level (500-year flood level), coastal storm surge can flank the dam by 2045 and overtop the dam by 2050. The analysis also predicts that at the 1% risk level (100-year flood level), coastal storm surge can flank the dam by 2055 and overtop the dam by 2065.

Graphic 4.19-2 BH-FRM Coastal Flood Depth (0.1% Probability)



2070

Graphic 4.19-3 BH-FRM Coastal Flood Depth (1% Probability)



2070

4.19.4 Heat Vulnerability

Paved surfaces are prevalent in urban areas, and are an essential component of highway and transportation corridors. However, the amount of paving and its albedo (degree of reflectivity) can be a driver of the urban heat island effect. The urban heat island effect is the occurrence of higher surface and ambient temperatures in urban settings than in surrounding rural areas due to human activity, most notably the conversion of vegetated surfaces to heat-absorbing non-vegetated surfaces. Other contributing factors to the urban heat island effect include urban geometry (which can trap heat or block convective cooling) and waste heat from automobiles and buildings. As global temperatures in the Northeast rise with the changing climate, the potential for exacerbated heat island effects increases.

Since low albedo surfaces are a primary driver of the urban heat island effect, they are the focus of this assessment. Low albedo surfaces in the urban fabric can be paved surfaces (such as roads, sidewalks and parking lots) or building surfaces (such as roofs). Since the proposed project will alter roadways, these are the focus of this assessment.

Under present conditions, pre-AET, the Project Area consists of 65.7 acres of paved roadways, 3.1 acres of paved sidewalks, and 5.5 acres of paved parking lots. Since there is variability in all these surfaces throughout the Project Area and limited data on Boston's regional heat island, the relative contribution of Project Area paved surfaces to the regional urban heat island effect is not known. However it is reasonable to assume that, given existing conditions in the Project Area, any increases in ambient temperatures due to climate change are likely to drive commensurate increases in the urban heat island effect throughout the Project Area.

4.20 Oil and Hazardous Materials

Oil and Hazardous Materials (OHM) typically come to rest on a site due to current or past uses on a given site. As noted in Section 4.2, the existing land use within the Project Area consists of highway and street roadways, and railroad transportation elements surrounded by open space, largely portions of the former rail yard. The Project Area has historically operated as a railroad yard since the mid-1800s with associated buildings and structures including roundhouses, coal pockets and rail car repair shops. Additional historical uses within the Project Area include auto shops and filling stations located along Cambridge Street along the northwest boundary of the Site, and industrial gas companies located in the northern portion of the Project Area between Cambridge Street and the Charles River (now the Doubletree Hotel). Portions of the Project Area were taken by MassDOT by eminent domain for the construction of I-90 in the 1950s to 1960s.

Railroad corridors and associated yards like the BPY are often impacted with residual OHM, including metals, pesticides, and petroleum constituents such as polycyclic aromatic hydrocarbons (PAHs). Railroad-related sources of OHM may include creosote- or arsenic- laced railroad ties, herbicides, lubricating oils, diesel fuel, and diesel exhaust. Materials used in the construction of buildings or other infrastructure features that require removal may also contain regulated materials, such as asbestos, PCBs, or lead based paint (LBP). In addition, fill of unknown origin used to bring tracks to grade may contain debris, coal, coal ash, coal slag, or other potential contaminants.

The presence of OHM in soil and groundwater can impact both construction management and ultimate site uses. To characterize the existing OHM within the Project Area and vicinity, the following databases and historical sources were reviewed.

- Federal databases including the current CERCLIS, NPL, RCRA TSD, RCRA Generators, and ERNS list. The state databases included the state equivalent CERCLIS list, spills, USTs, SWL, and public water supply lists.
- MassDEP files to provide more information about reported releases of OHM identified through the database search on or adjacent to the Project Area. The MassDEP files provided additional information regarding past ownership; historical site usage; past usage, storage and disposal of OHM on and adjacent to the Project Area; and other evidence of potential environmental impacts.
- Municipal and historical files to help confirm ownership history and past usage. Resources included tax records, aerial photographs, Board of Health Department records, Building Department records, Fire Department records, Conservation Commission records, and Sanborn fire insurance maps. The site history review also identified reports of historic spills, disposal areas, or other past releases of OHM on or adjacent to the property.

In addition to database review, MassDOT conducted site reconnaissance on accessible portions of the Project Area to observe overt evidence of a release or threat of release of oil or hazardous materials. The uses of abutting properties were also documented.

Several disposal sites as defined in the Massachusetts Contingency Plan (MCP), or 310 Code of Massachusetts Regulations 40.0000, were identified on or within the vicinity of the Project Area. The presence of a disposal site indicates that a release of OHM has been reported to MassDEP. Once reported to MassDEP, a disposal site is assigned a Release Tracking Number (RTN) and undergoes assessment and response actions, (if required), in accordance with the MCP until regulatory closure has been achieved.

Based on the information reviewed, a total of 139 sites with known reported releases of OHM were identified in the Project Area listed in Table 4.20-1 and shown on Figure 4.20-1. Of these, 77 were located within the project limits, and 62 were located on abutting or nearby properties. An additional 63 listings of conditions with the potential to release OHM (such as underground storage tanks or registered hazardous waste generators) were identified; 20 were within the Project Area boundaries, and 43 were located on neighboring properties.

It is important to note that of the 139 instances of known release of OHM in and around the project limits, 125 have achieved some type of permanent regulatory closure and are no longer under active investigation. Only nine listed sites with known releases of OHM located within the project limits and four such sites on neighboring properties are still undergoing active investigation or have not yet achieved a permanent solution.

The overwhelming number of reported OHM releases within the project limits are attributable to some type of petroleum product (diesel fuel, cable oil, hydraulic oil, lubricating oil, etc.) or materials related to fuel or combustion of fuels. In addition, select metals (lead, chromium, arsenic, etc.) have been detected at levels above reporting thresholds. These materials are typical of railyards in urban areas, some of which may be attributable to historic fill. Many of the reportable incidents were relatively small (less than 100 gallons), and were remediated in a relatively short time. This too is typical for long-operating rail yard operations. Details regarding the nature and extent of all of these releases can be found in Appendix J, Hazardous Materials Assessment Report.

Table 4.20-1: Reported OHM Releases in the Project Area

Known Reported Releases of OHM	Within Project Area	Abutting/ Nearby Properties	Total
Active Status	5	4	9
Temporary Solution	4	1	5
No Further Action (Permanent Solution, Downgradient Property Status, Linked to another RTN, etc.)	68	57	125
Total	**77**	**62**	**139**

N
Legend
Project Area
Affected Area
EJ Criteria, by Block Group

Graphic 4.21-1: MassGIS EJ Population Datalayer

4.21 Environmental Justice

4.21.1 Environmental Justice Law and Regulations

Environmental Justice laws and regulations are included in the environmental review of public projects to disclose potential impacts on minority and low income populations and to address any disproportionate effects.

Title VI of the Civil Rights Act of 1964 states that: "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

Executive Order 12898, of February 11, 1994, is the basis for several regulatory documents developed by federal agencies subject to its mandate. The Order sets out the regulatory requirements for addressing "environmental justice in minority populations and low income populations." It is intended to ensure that federally funded projects identify and address disproportionately high adverse health or environmental (including related social and economic) impacts on minority and low-income populations.

The National Environmental Policy Act (NEPA) provides guidance for considering this issue for activities falling under the NEPA. FHWA has also established guidance and procedures to ensure FHWA compliance with EO 12898 and with Order 5610.2(a) issued by the U.S. DOT.

In November 2014, Governor Deval Patrick issued Executive Order 552 to encourage sustained and continued efforts now and into the future to ensure that environmental justice remains a priority for the executive branch. The EOEEA has established an Environmental Justice Policy (EJ) that aims to limit or mitigate adverse environmental impacts on EJ populations and to promote the environmental benefits of public projects for these populations. Although the Allston I-90 Interchange Project is not subject to this policy, MassDOT has committed to evaluating its EJ impacts based on federal and state guidelines. Accordingly, the identification of EJ populations is based on census data indicating block groups with households who meet one or more of the following EOEEA Policy criteria:

- 25% of households within the census block group have a median annual household income at or below 65% of the statewide median income for Massachusetts; or
- 25% or more of the residents are minority; or
- 25% or more of the residents have English isolation.

4.21.2 Determining Whether Environmental Justice Populations Are Present in the Affected Area

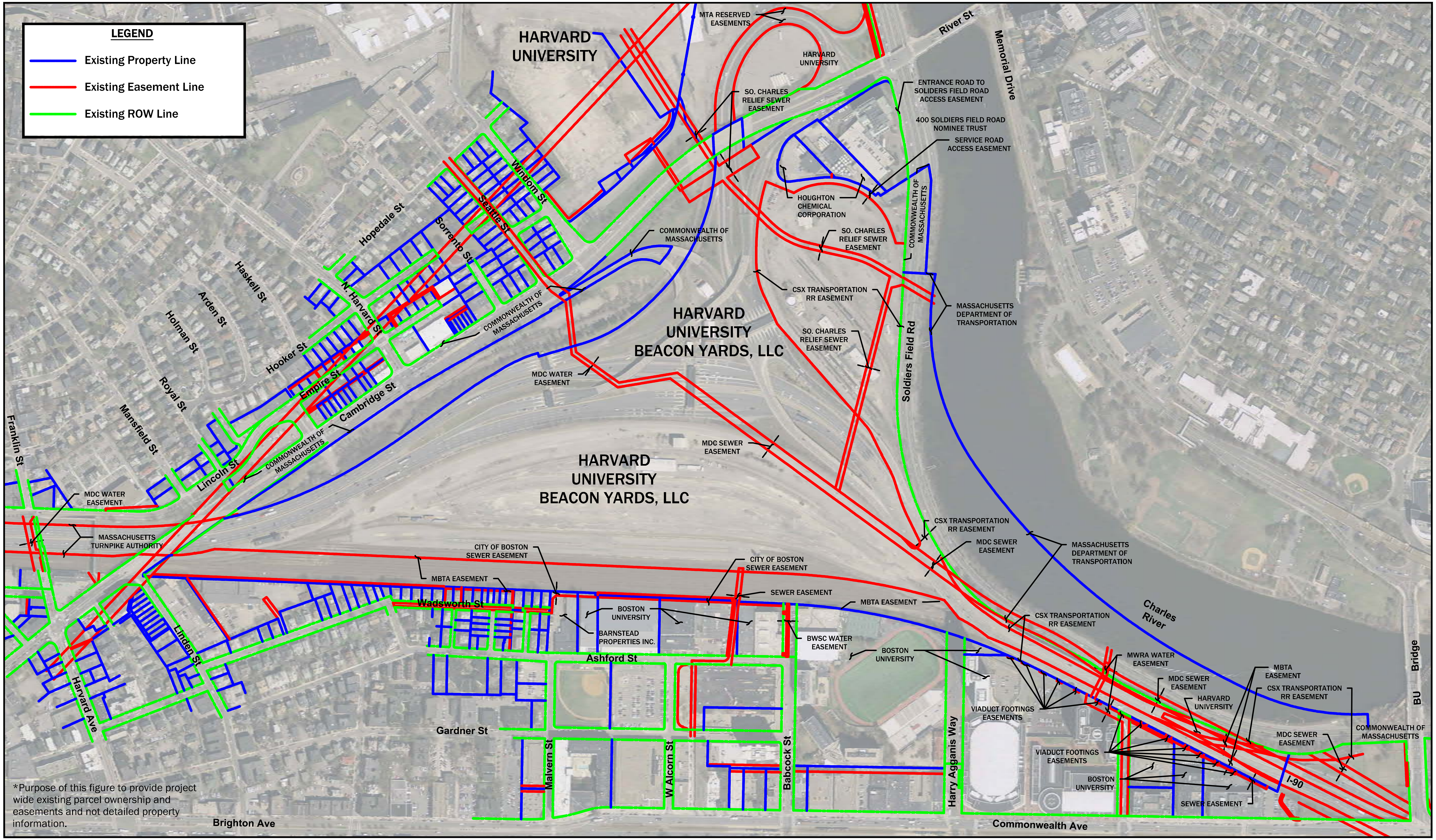
As shown in the MassGIS Environmental Justice Viewer datalayer, (Graphic 4.21-1), U.S. Census block group data indicate that almost all of the Boston, and some of the Cambridge blocks, contain EJ populations. The majority are minority households (yellow areas), and a substantial area in Boston meets both income and minority criteria (green areas). None are identified as being isolated because of a lack of English language skills in the household. Graphic 4.21 shows the Project Area and outlines the affected area as that will most likely be directly affected by the Project.

The following sections summarize detailed information provided in Tables 4.6.1 and 4.6.2 in Appendix D, Socioeconomic Data, where relevant characteristics of the population located in the Local Project Area limits to better understand the nature of the underlying neighborhoods. Table 4.6.1 shows 39% of the affected households are minority, exceeding the EOEEA criterion of 25%. The largest single minority population is Asian (18%), followed by Hispanic (14.3%). Since Asia is a highly diverse continent, defining a community as simply "Asian" hides important distinctions.

Table 4.6.2 also shows the Asian population distribution across ethnicities where the Chinese population is 42% of the total Asian population of the local affected area. It represents 8% of the total population in the affected area. Boston, by comparison, has a Chinese population of 4% of the city's total Asian population; Cambridge's Chinese population is 6% of the city's.

The second part of Table 4.6.1 shows languages spoken at home, included as another way of identifying potential EJ populations. While no one non-English language group appears to raise such concerns, the presence of over 3,000 Spanish speakers in the Local Project Area neighborhood suggests a need for outreach programs to consider them in participation strategies.

Regarding incomes, households meeting the EOEEA standard of 65% of the state median represent 46% the population of the affected area, compared to 42% of Boston households and 31% of Cambridge's. Of particular concern are the 30% of Project Area households with incomes under $25,000 (see Section 4.5.2).


LEGEND
Existing Property Line
Existing Easement Line
Existing ROW Line
HARVARD UNIVERSITY
MTA RESERVED EASEMENTS
HARVARD UNIVERSITY
River St
Memorial Drive
SO. CHARLES RELIEF SEWER EASEMENT
ENTRANCE ROAD TO SOLIDERS FIELD ROAD ACCESS EASEMENT
400 SOLDIERS FIELD ROAD NOMINEE TRUST
SERVICE ROAD ACCESS EASEMENT
HOUGHTON CHEMICAL CORPORATION
COMMONWEALTH OF MASSACHUSETTS
SO. CHARLES RELIEF SEWER EASEMENT
COMMONWEALTH OF MASSACHUSETTS
Windom St
Searle St
Sorrento St
Hopedale St
Haskell St
Arden St
Holman St
N Harvard St
Hooker St
Empire St
Cambridge St
Royal St
Mansfield St
Lincoln St
Franklin St
COMMONWEALTH OF MASSACHUSETTS
COMMONWEALTH OF MASSACHUSETTS
HARVARD UNIVERSITY BEACON YARDS, LLC
CSX TRANSPORTATION RR EASEMENT
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
SO. CHARLES RELIEF SEWER EASEMENT
Soldiers Field Rd
MDC WATER EASEMENT
MDC SEWER EASEMENT
HARVARD UNIVERSITY BEACON YARDS, LLC
MDC WATER EASEMENT
MASSACHUSETTS TURNPIKE AUTHORITY
CITY OF BOSTON SEWER EASEMENT
MBTA EASEMENT
CITY OF BOSTON SEWER EASEMENT
SEWER EASEMENT
CSX TRANSPORTATION RR EASEMENT
MDC SEWER EASEMENT
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION
Charles River
Wadsworth St
BOSTON UNIVERSITY
BARNSTEAD PROPERTIES INC.
MBTA EASEMENT
BWSC WATER EASEMENT
BOSTON UNIVERSITY
CSX TRANSPORTATION RR EASEMENT
Linden St
Ashford St
MWRA WATER EASEMENT
MBTA EASEMENT
MDC SEWER EASEMENT
CSX TRANSPORTATION RR EASEMENT
HARVARD UNIVERSITY
BU Bridge
VIADUCT FOOTINGS EASEMENTS
VIADUCT FOOTINGS EASEMENTS
COMMONWEALTH OF MASSACHUSETTS
MDC SEWER EASEMENT
Harvard Ave
Gardner St
Malvern St
W Alcorn St
Babcock St
Harry Agganis Way
BOSTON UNIVERSITY
SEWER EASEMENT
I-90
Brighton Ave
Commonwealth Ave

*Purpose of this figure to provide project wide existing parcel ownership and easements and not detailed property information.

0 250 500
Feet

I-90 Allston Interchange Project
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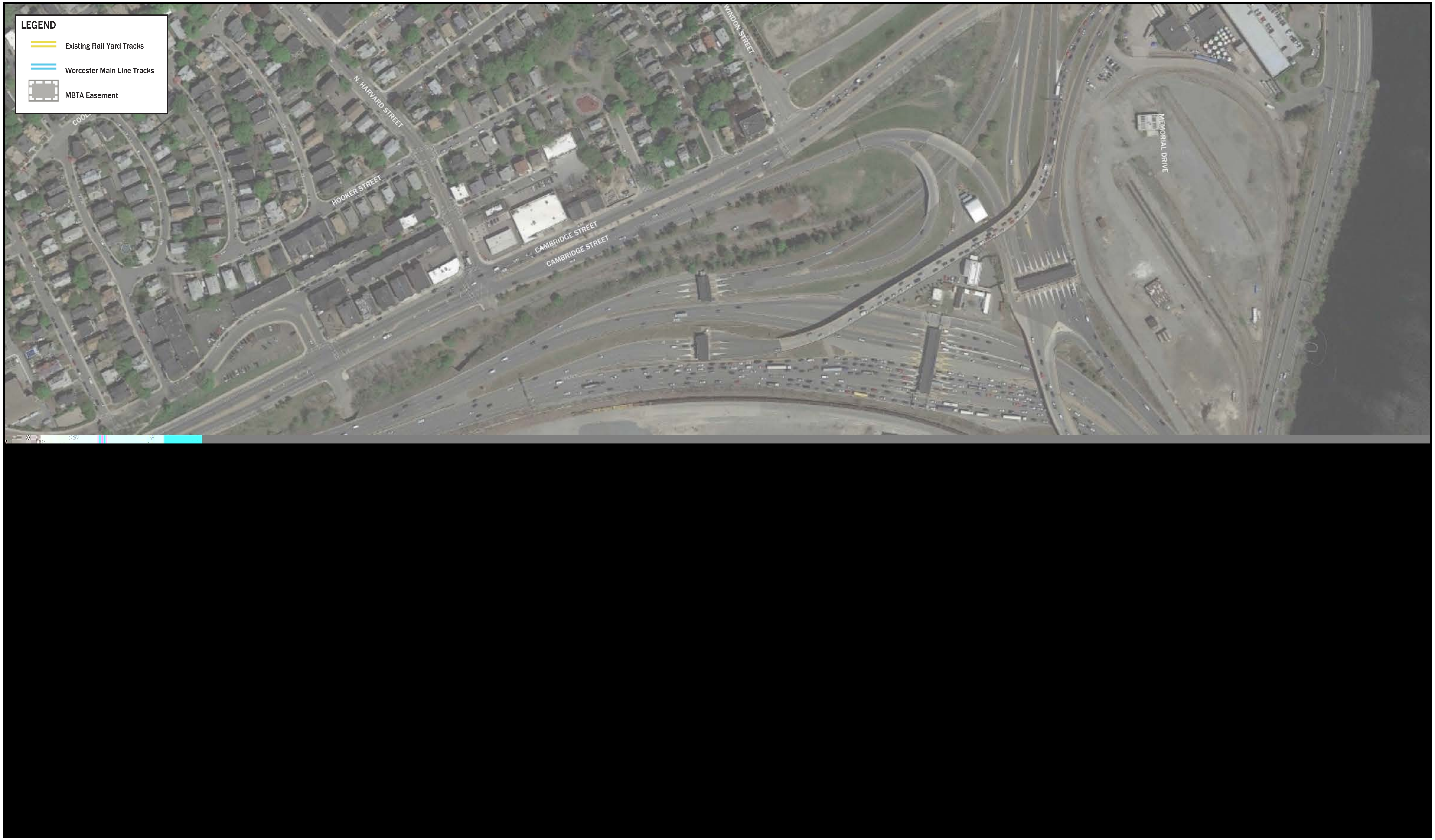
FIGURE
4.2-1

Existing Parcel Ownership and Easements

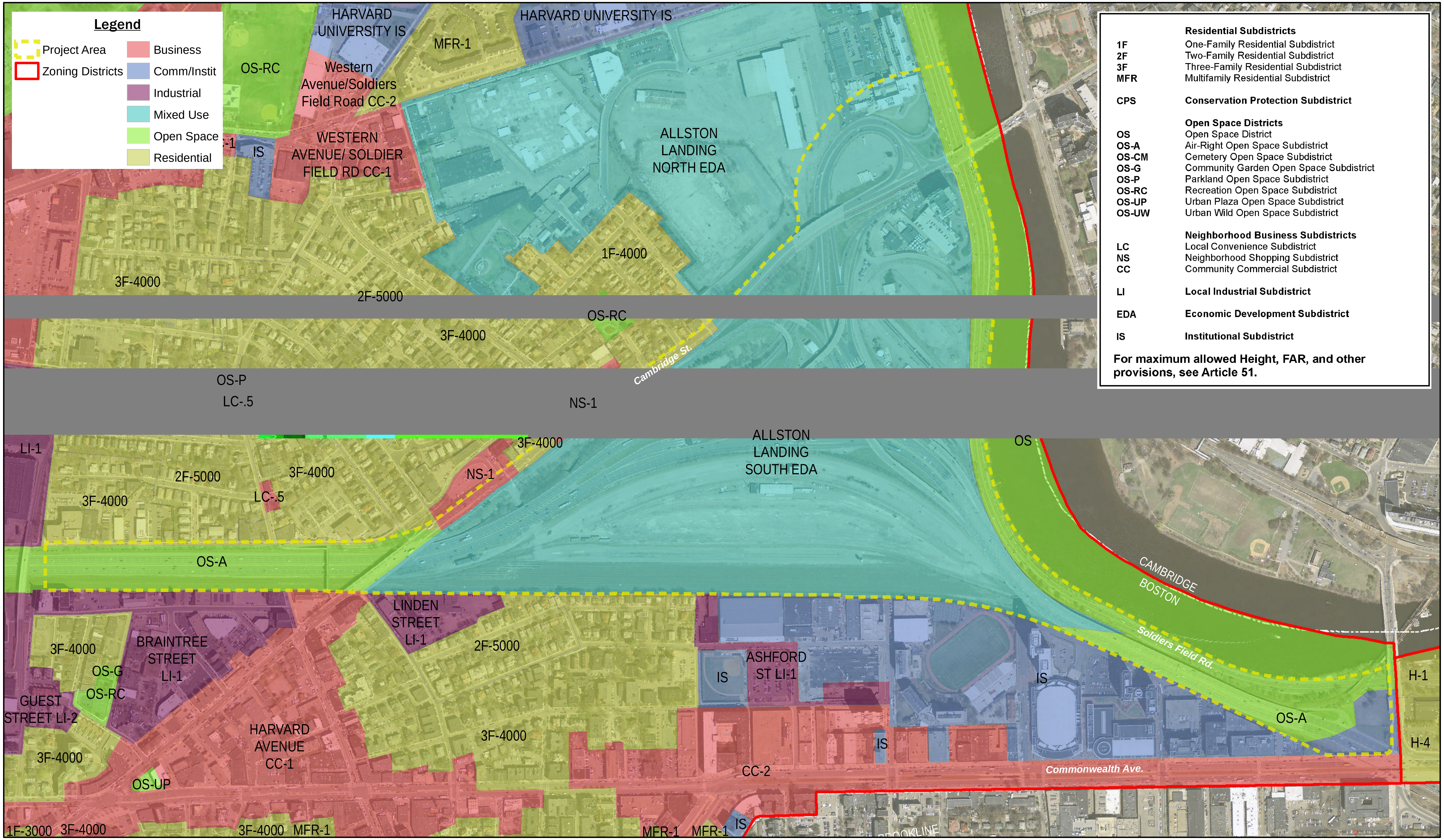

LEGEND
Existing Rail Yard Tracks
Worcester Main Line Tracks
MBTA Easement
N. HARVARD STREET
WINDOM STREET
HOOKER STREET
CAMBRIDGE STREET
CAMBRIDGE STREET
MEMORIAL DRIVE
COOL

I-90 Allston Interchange Project
Draft Environmental Impact Report

Not To Scale

Rail Yard, Worcester Main Line and MBTA Easement

FIGURE
4.2-2


Legend
Project Area
Zoning Districts
Business
Comm/Instit
Industrial
Mixed Use
Open Space
Residential
HARVARD UNIVERSITY IS
HARVARD UNIVERSITY IS
MFR-1
OS-RC
Western Avenue/Soldiers Field Road CC-2
WESTERN AVENUE/ SOLDIER FIELD RD CC-1
IS
ALLSTON LANDING NORTH EDA
1F-4000
3F-4000
2F-5000
OS-RC
3F-4000
Cambridge St.
OS-P
LC-.5
NS-1
ALLSTON LANDING SOUTH EDA
OS
LI-1
2F-5000
3F-4000
3F-4000
3F-4000
NS-1
LC-.5
OS-A
LINDEN STREET LI-1
2F-5000
BRAINTREE STREET LI-1
3F-4000
OS-G
OS-RC
GUEST STREET LI-2
3F-4000
HARVARD AVENUE CC-1
3F-4000
ASHFORD ST LI-1
IS
IS
IS
CAMBRIDGE
BOSTON
Soldiers Field Rd.
OS-A
H-1
H-4
OS-UP
CC-2
Commonwealth Ave.
1F-3000
3F-4000
3F-4000
MFR-1
MFR-1
MFR-1
IS
BROOKLINE

	Residential Subdistricts
1F	One-Family Residential Subdistrict
2F	Two-Family Residential Subdistrict
3F	Three-Family Residential Subdistrict
MFR	Multifamily Residential Subdistrict
CPS	**Conservation Protection Subdistrict**
	Open Space Districts
OS	Open Space District
OS-A	Air-Right Open Space Subdistrict
OS-CM	Cemetery Open Space Subdistrict
OS-G	Community Garden Open Space Subdistrict
OS-P	Parkland Open Space Subdistrict
OS-RC	Recreation Open Space Subdistrict
OS-UP	Urban Plaza Open Space Subdistrict
OS-UW	Urban Wild Open Space Subdistrict
	Neighborhood Business Subdistricts
LC	Local Convenience Subdistrict
NS	Neighborhood Shopping Subdistrict
CC	Community Commercial Subdistrict
LI	**Local Industrial Subdistrict**
EDA	**Economic Development Subdistrict**
IS	**Institutional Subdistrict**

For maximum allowed Height, FAR, and other provisions, see Article 51.

0 250 500
Feet

Source: City of Boston Zoning Open Data

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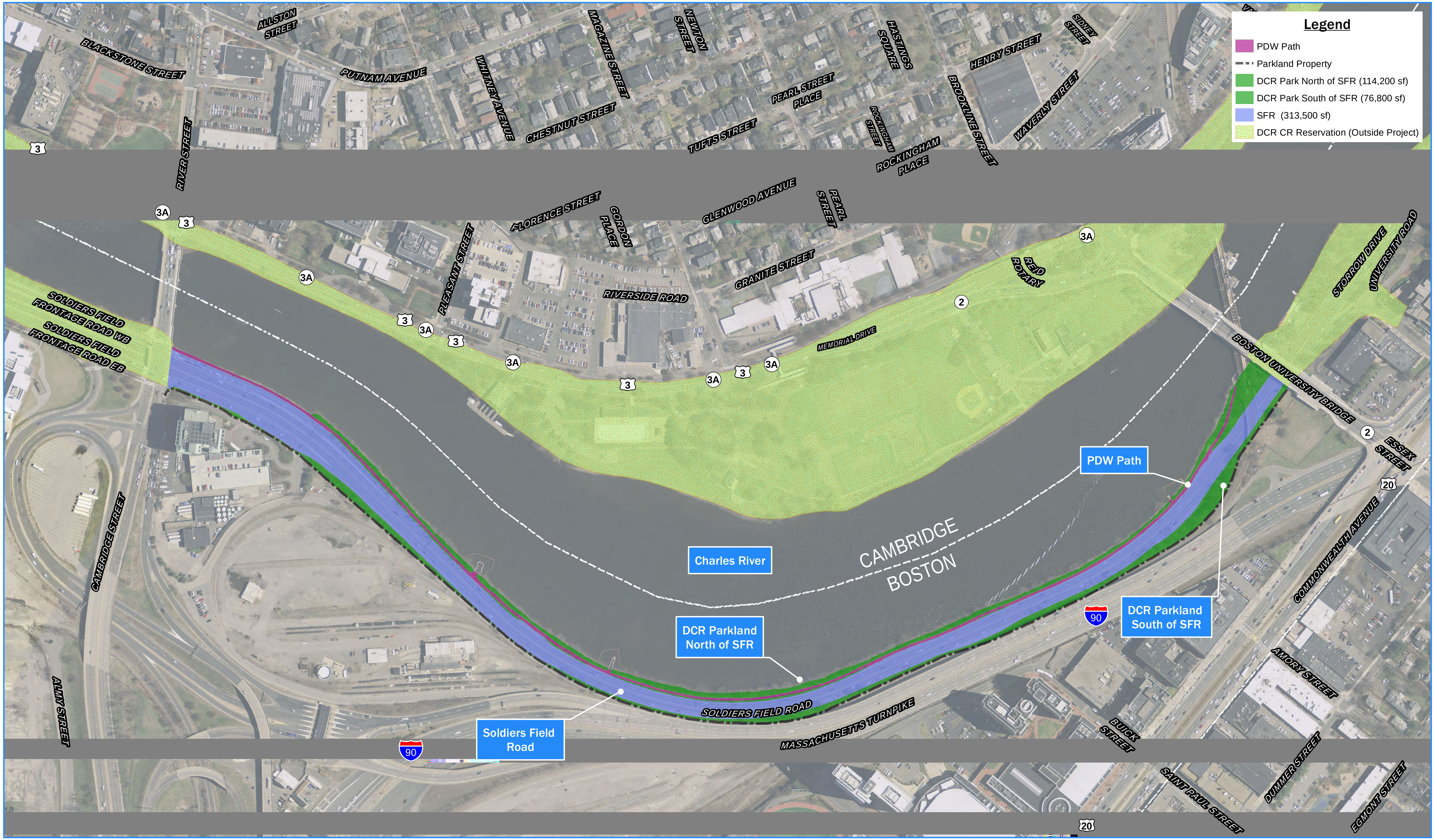
FIGURE

City of Boston Zoning

4.2-3


Legend
🟪 PDW Path
--- Parkland Property
🟩 DCR Park North of SFR (114,200 sf)
🟩 DCR Park South of SFR (76,800 sf)
🟦 SFR (313,500 sf)
▨ DCR CR Reservation (Outside Project)
PDW Path
Charles River
CAMBRIDGE
BOSTON
DCR Parkland North of SFR
DCR Parkland South of SFR
Soldiers Field Road
SOLDIERS FIELD ROAD
MASSACHUSETTS TURNPIKE
SOLDIERS FIELD FRONTAGE ROAD WB
SOLDIERS FIELD FRONTAGE ROAD EB
BOSTON UNIVERSITY BRIDGE
ALLSTON STREET
BLACKSTONE STREET
PUTNAM AVENUE
WHITNEY AVENUE
MAGAZINE STREET
CHESTNUT STREET
NEWTON STREET
TUFTS STREET
PEARL STREET PLACE
HASTINGS SQUARE
ROCKINGHAM STREET
ROCKINGHAM PLACE
BROOKLINE STREET
HENRY STREET
SIDNEY STREET
WAVERLY STREET
RIVER STREET
FLORENCE STREET
CORDON PLACE
GLENWOOD AVENUE
PEARL STREET
PLEASANT STREET
RIVERSIDE ROAD
GRANITE STREET
MEMORIAL DRIVE
REID ROTARY
STORROW DRIVE
UNIVERSITY ROAD
ESSEX STREET
COMMONWEALTH AVENUE
AMORY STREET
BUICK STREET
SAINT PAUL STREET
DUMMER STREET
EGMONT STREET
CAMBRIDGE STREET
ALMY STREET
3
3A
2
20
90

0 150 300
Feet

Notes:
1. Entire flowed portion of Charles River is also included in Charles River Reservation
2. All DCR Land, including SFR and Charles River is considered 4(f) and Article 97 Land

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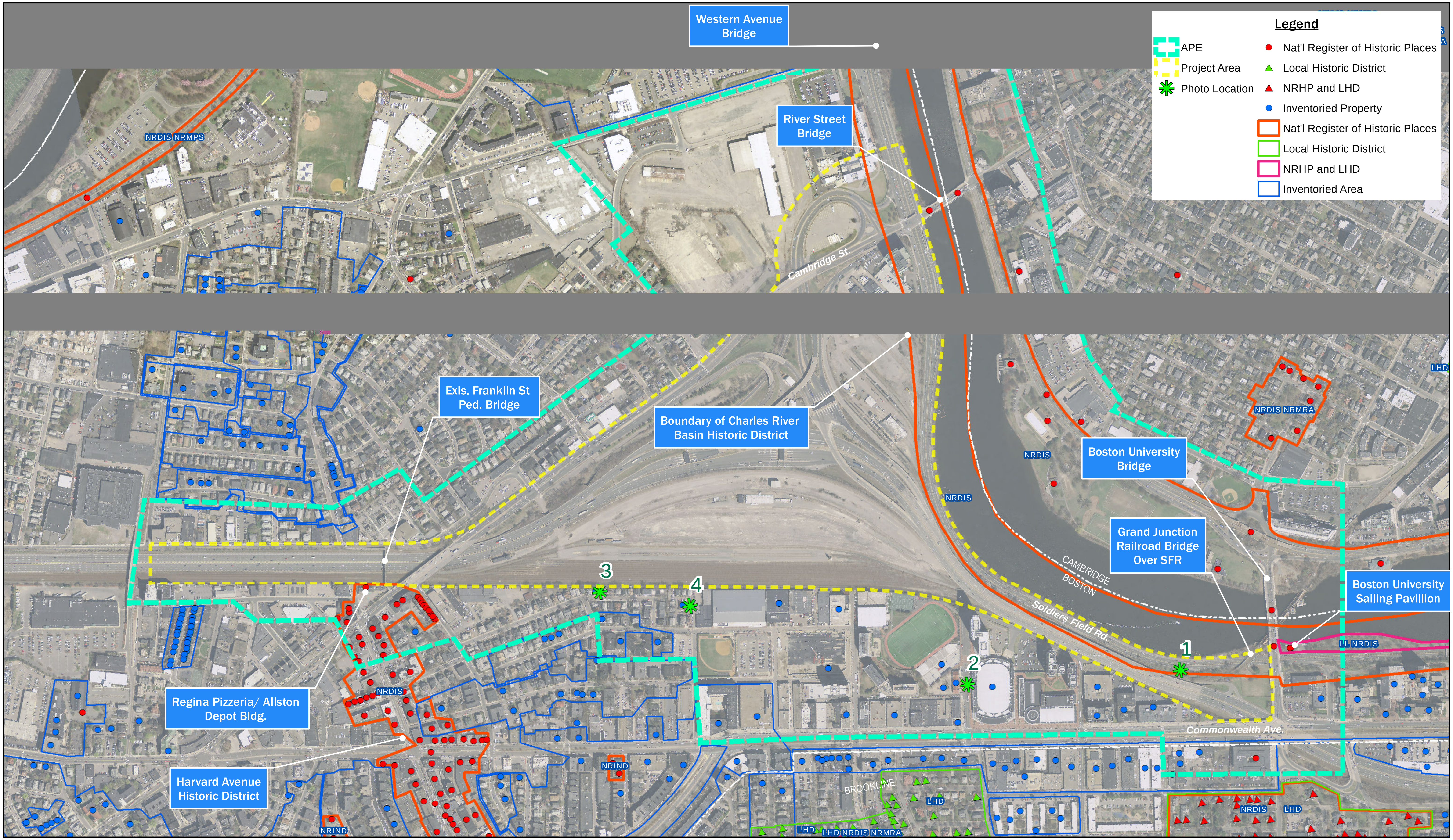
Existing DCR Public Parkland 4 (f) and Article 97 Land

FIGURE
4.4-1

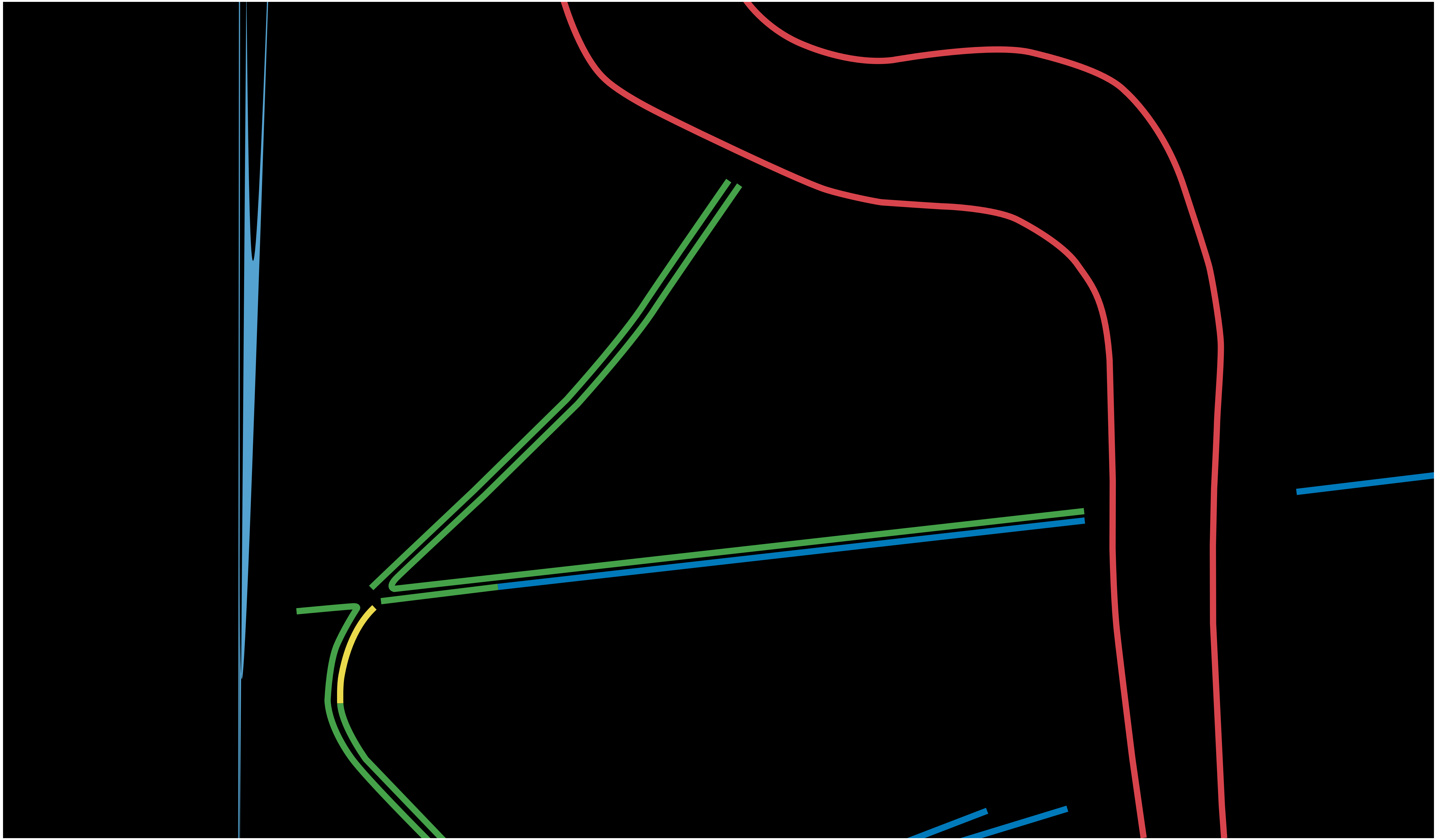

Legend
APE
Project Area
Photo Location
● Nat'l Register of Historic Places
▲ Local Historic District
▲ NRHP and LHD
● Inventoried Property
▭ Nat'l Register of Historic Places
▭ Local Historic District
▭ NRHP and LHD
▭ Inventoried Area
Western Avenue Bridge
River Street Bridge
NRDIS NRMPS
Cambridge St.
Exis. Franklin St Ped. Bridge
Boundary of Charles River Basin Historic District
Boston University Bridge
NRDIS
NRDIS
NRDIS NRMRA
LHD
Grand Junction Railroad Bridge Over SFR
CAMBRIDGE
BOSTON
Soldiers Field Rd
Boston University Sailing Pavillion
LL NRDIS
1
2
3
4
Regina Pizzeria/ Allston Depot Bldg.
NRDIS
Harvard Avenue Historic District
NRIND
NRIND
Commonwealth Ave.
BROOKLINE
LHD
LHD
LHD NRDIS NRMRA
NRDIS
LHD
N
0 300 600
Feet

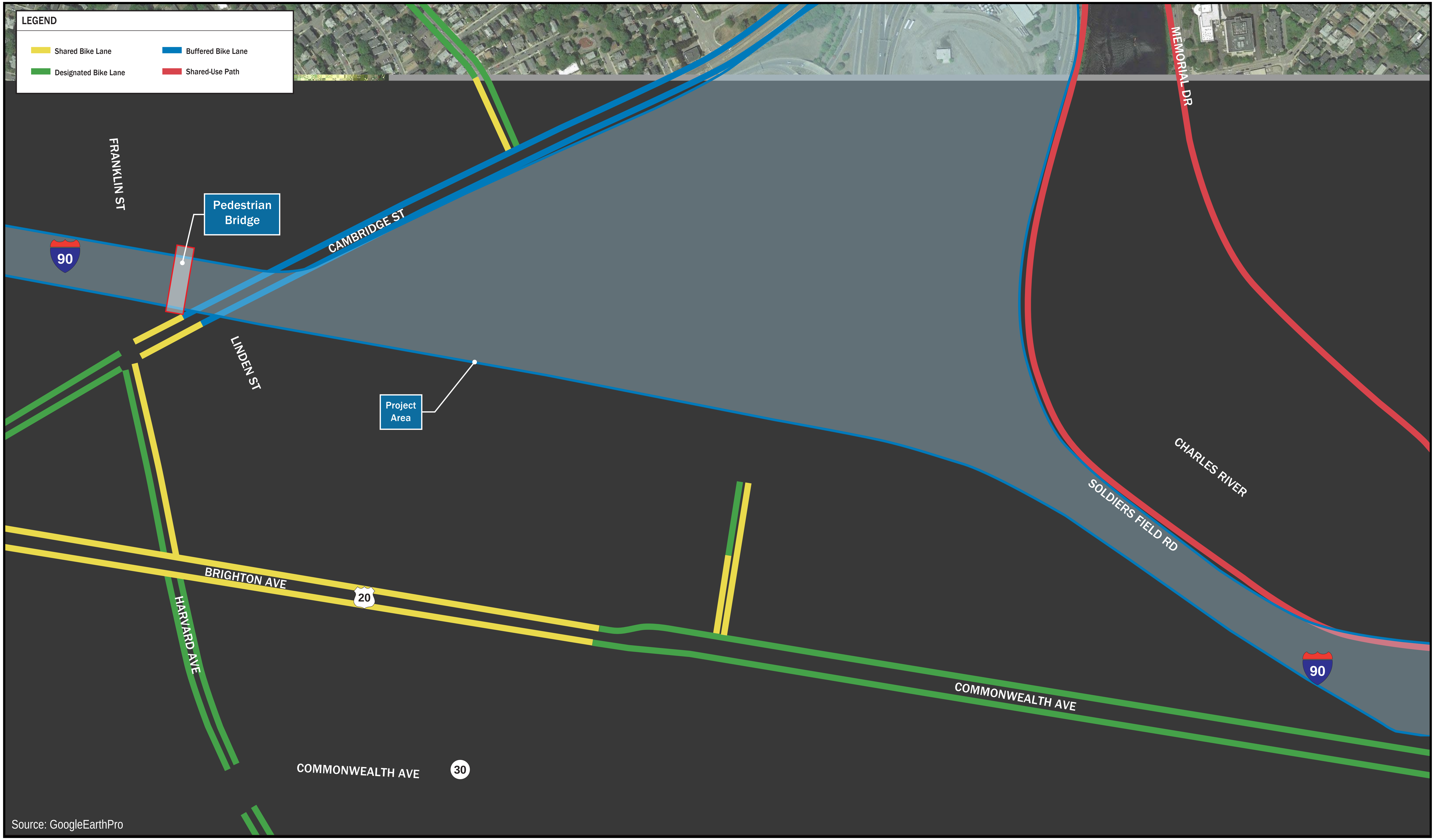
I-90 Allston Interchange
Draft Environmental Impact Report

Notes:
1. Data Source: MassGIS/MHC Historic Data
2. APE - Area of Potential Effect

FIGURE 4.6-1

Historic Resources and Area of Potential Effect



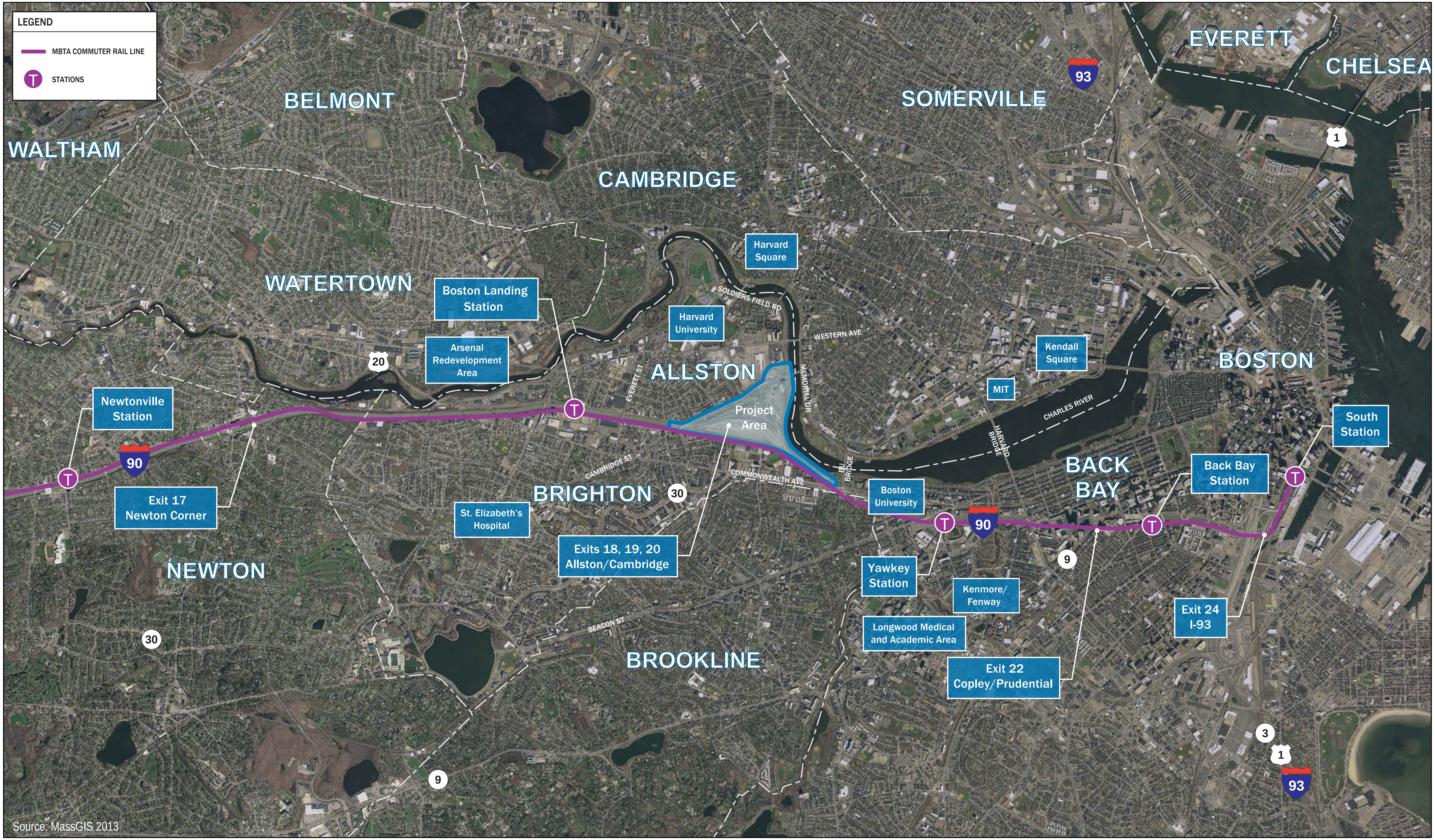

LEGEND
Shared Bike Lane
Buffered Bike Lane
Designated Bike Lane
Shared-Use Path
FRANKLIN ST
Pedestrian Bridge
CAMBRIDGE ST
90
LINDEN ST
Project Area
MEMORIAL DR
CHARLES RIVER
SOLDIERS FIELD RD
BRIGHTON AVE
20
HARVARD AVE
COMMONWEALTH AVE
90
COMMONWEALTH AVE
30
0 200 400
Feet

Source: GoogleEarthPro

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE
4.7-2

Existing Pedestrian & Bicycle Facilities (South)


LEGEND
MBTA COMMUTER RAIL LINE
T STATIONS
WALTHAM
BELMONT
CAMBRIDGE
SOMERVILLE
EVERETT
CHELSEA
93
1
WATERTOWN
Boston Landing Station
Arsenal Redevelopment Area
20
Harvard Square
Harvard University
SOLDIERS FIELD RD
WESTERN AVE
ALLSTON
EVERETT ST
MEMORIAL DR
Project Area
Kendall Square
MIT
BOSTON
CHARLES RIVER
HARVARD BRIDGE
Newtonville Station
90
Exit 17 Newton Corner
CAMBRIDGE ST
BRIGHTON
30
COMMONWEALTH AVE
BU BRIDGE
Boston University
BACK BAY
Back Bay Station
South Station
St. Elizabeth's Hospital
Exits 18, 19, 20 Allston/Cambridge
Yawkey Station
9
Kenmore/ Fenway
NEWTON
Longwood Medical and Academic Area
Exit 24 I-93
BEACON ST
BROOKLINE
Exit 22 Copley/Prudential
3
N
0
1500
3000
Feet

Source: MassGIS 2013

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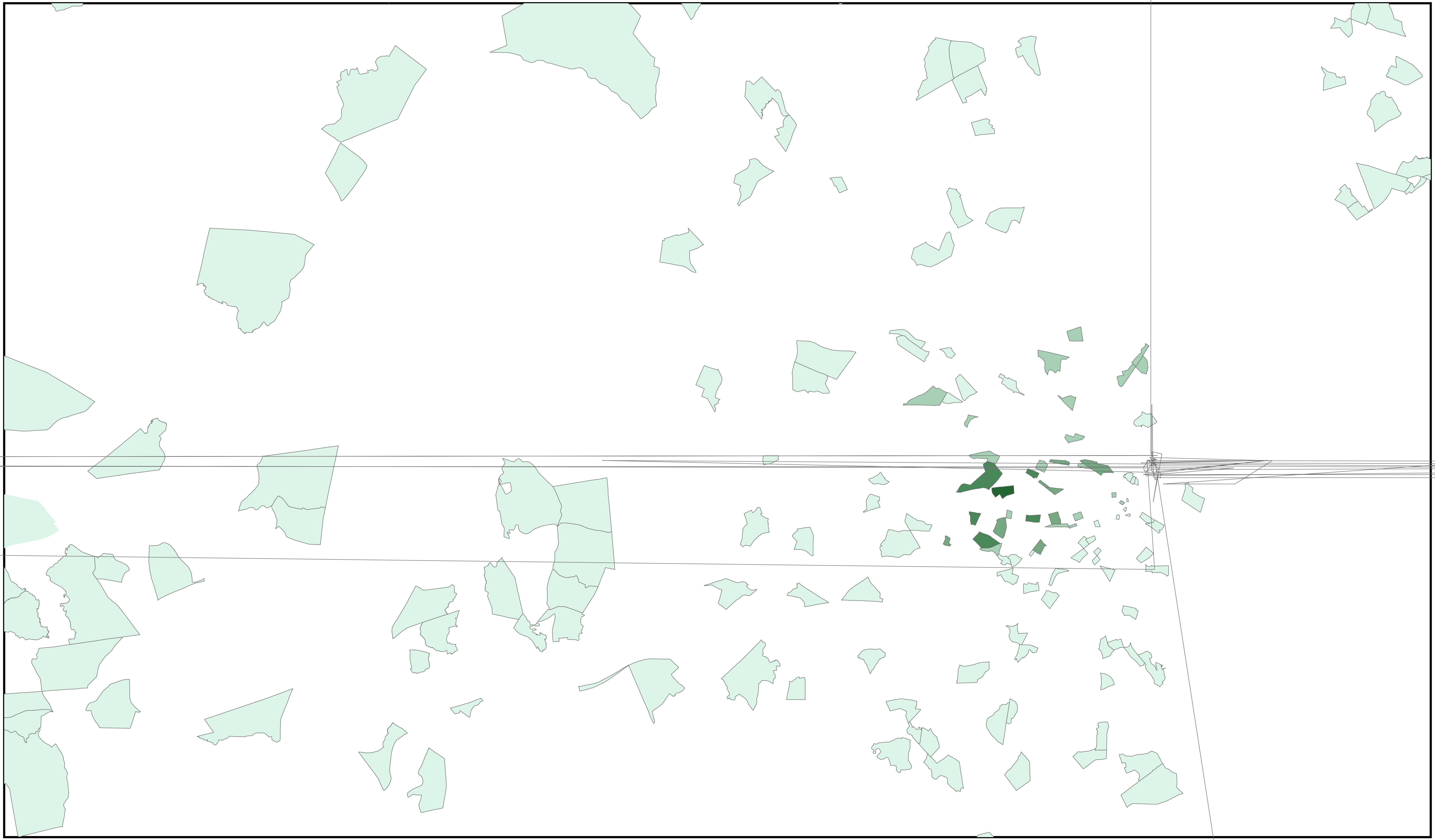
FIGURE
4.8-1

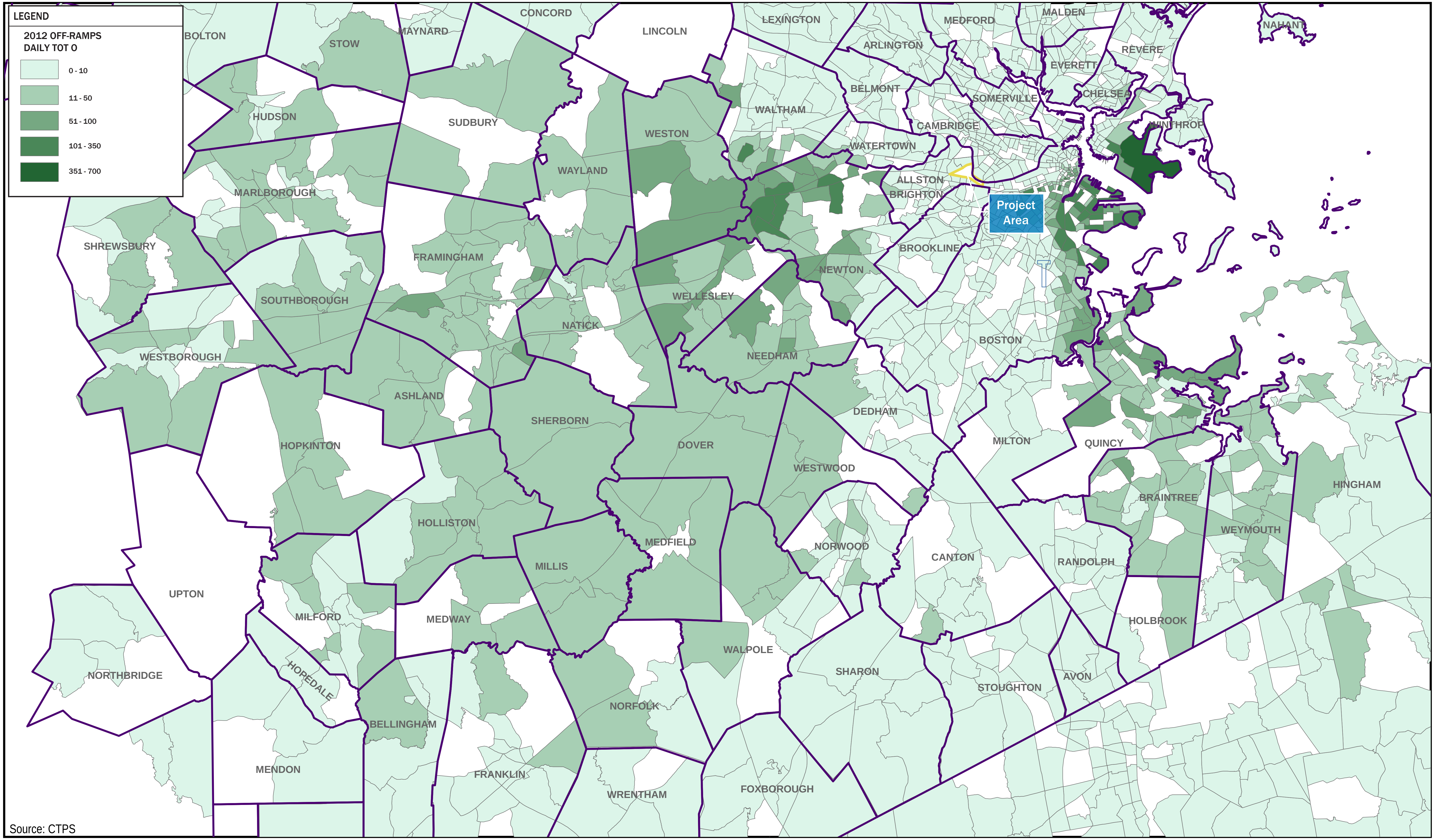
Regional Context



I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE
4.8-2

Allston Off-Ramps
Existing Traffic Destinations


LEGEND
2012 OFF-RAMPS
DAILY TOT O
0 - 10
11 - 50
51 - 100
101 - 350
351 - 700
BOLTON
STOW
MAYNARD
CONCORD
LINCOLN
LEXINGTON
MEDFORD
MALDEN
NAHANT
ARLINGTON
REVERE
EVERETT
BELMONT
SOMERVILLE
CHELSEA
HUDSON
SUDBURY
WESTON
WALTHAM
CAMBRIDGE
WINTHROP
WATERTOWN
WAYLAND
MARLBOROUGH
ALLSTON
BRIGHTON
Project Area
SHREWSBURY
FRAMINGHAM
BROOKLINE
NEWTON
SOUTHBOROUGH
WELLESLEY
NATICK
WESTBOROUGH
NEEDHAM
BOSTON
ASHLAND
SHERBORN
DEDHAM
HOPKINTON
DOVER
MILTON
QUINCY
WESTWOOD
HINGHAM
BRAINTREE
HOLLISTON
WEYMOUTH
MEDFIELD
NORWOOD
CANTON
RANDOLPH
MILLIS
UPTON
MILFORD
MEDWAY
HOLBROOK
WALPOLE
NORTHBRIDGE
HOPEDALE
SHARON
STOUGHTON
AVON
NORFOLK
BELLINGHAM
MENDON
FRANKLIN
WRENTHAM
FOXBOROUGH

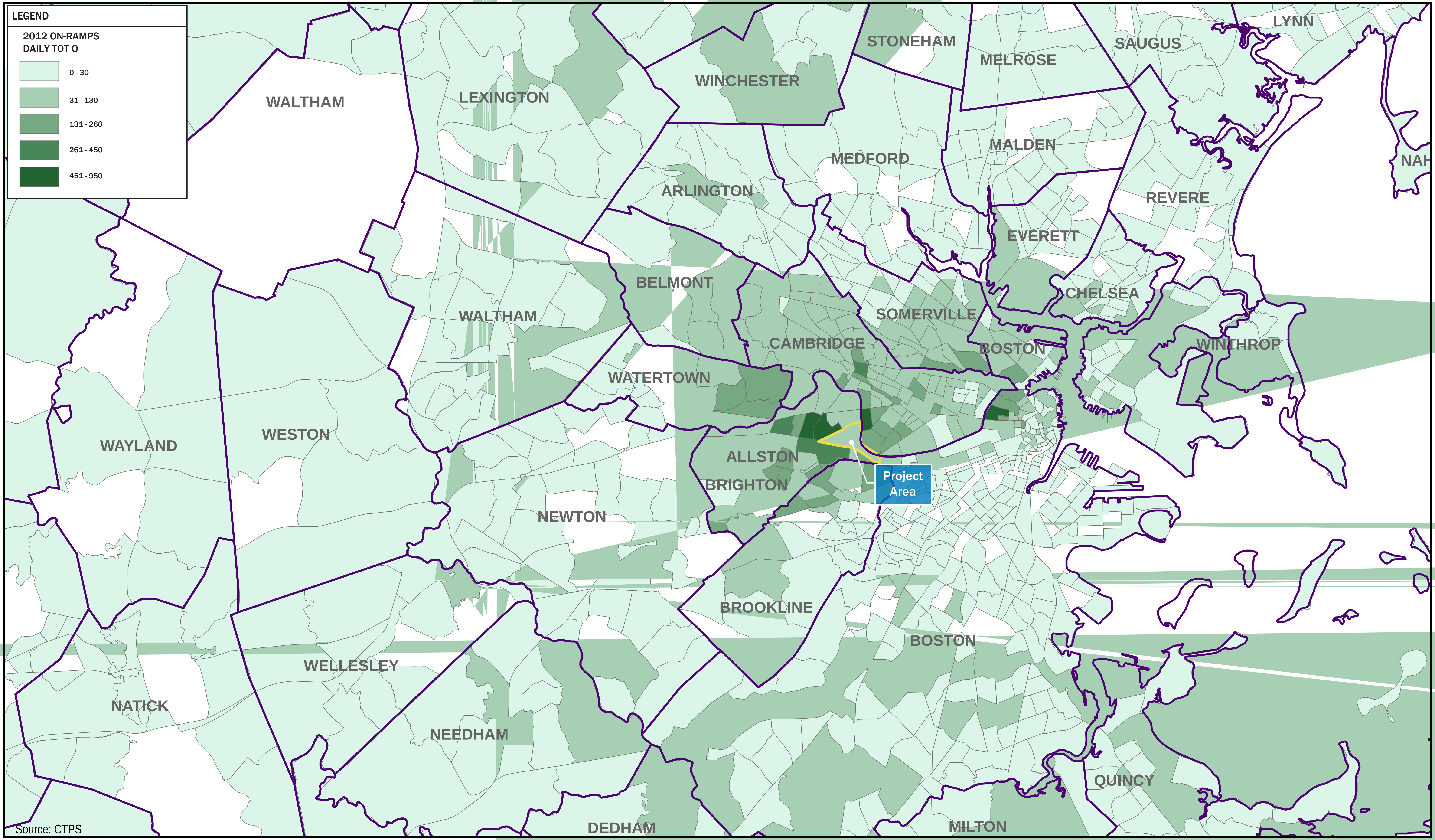
Source: CTPS

Not To Scale

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE
4.8-3

Allston Off-Ramps Existing Traffic Origins

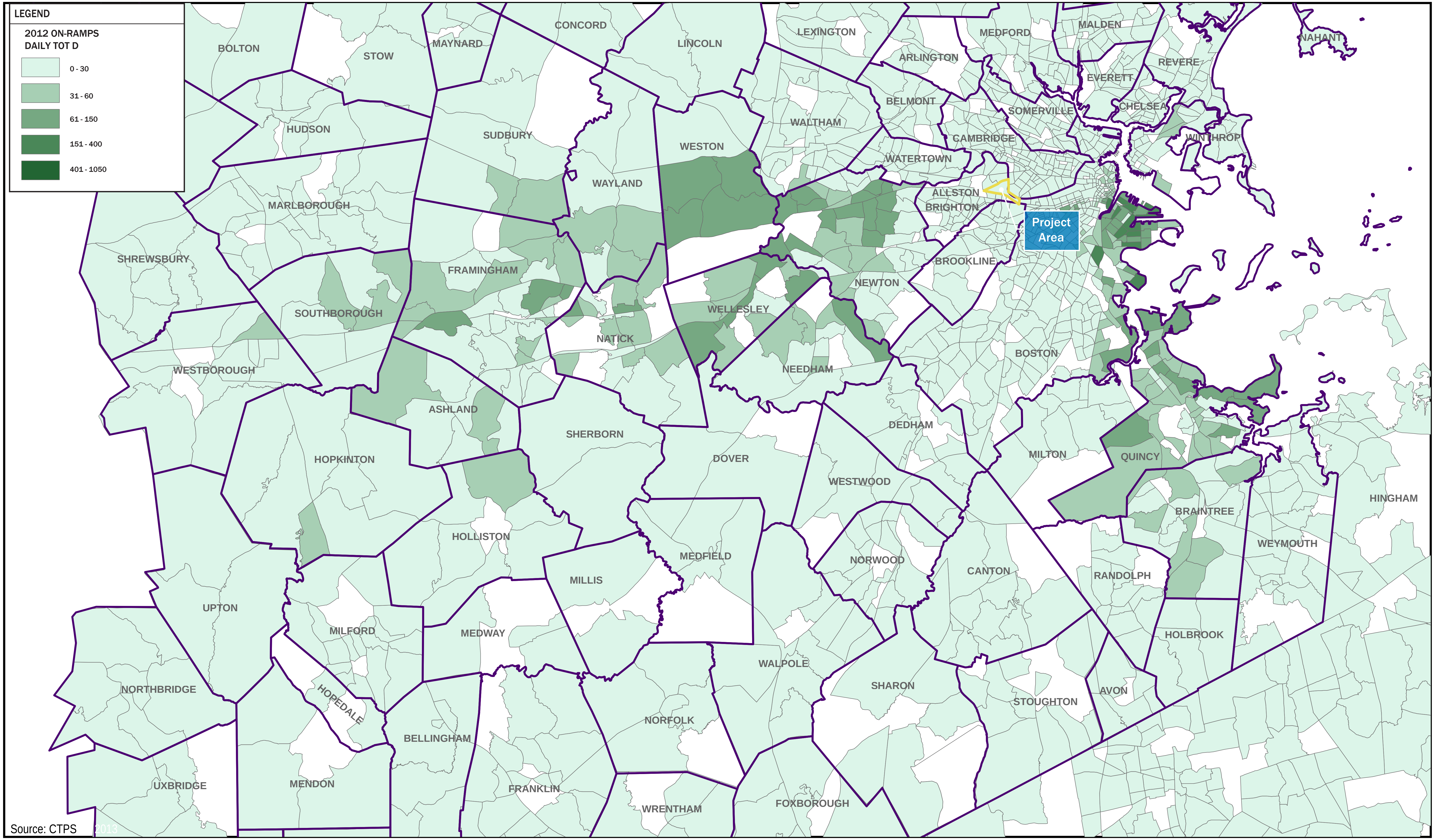

LEGEND
2012 ON-RAMPS
DAILY TOT O
0 - 30
31 - 130
131 - 260
261 - 450
451 - 950
WALTHAM
LEXINGTON
WINCHESTER
STONEHAM
MELROSE
SAUGUS
LYNN
MEDFORD
MALDEN
ARLINGTON
REVERE
NAH
EVERETT
BELMONT
CHELSEA
WALTHAM
SOMERVILLE
CAMBRIDGE
BOSTON
WINTHROP
WATERTOWN
WESTON
WAYLAND
ALLSTON
BRIGHTON
Project Area
NEWTON
BROOKLINE
BOSTON
WELLESLEY
NATICK
NEEDHAM
QUINCY
DEDHAM
MILTON

Source: CTPS

INTERSTATE 90 ALLSTON INTERCHANGE

massDOT Massachusetts Department of Transportation Highway Division

Not To Scale


LEGEND
2012 ON-RAMPS
DAILY TOT D
0 - 30
31 - 60
61 - 150
151 - 400
401 - 1050
BOLTON
STOW
MAYNARD
CONCORD
LINCOLN
LEXINGTON
MEDFORD
MALDEN
NAHANT
ARLINGTON
REVERE
EVERETT
BELMONT
SOMERVILLE
CHELSEA
HUDSON
SUDBURY
WALTHAM
WESTON
CAMBRIDGE
WINTHROP
WATERTOWN
WAYLAND
MARLBOROUGH
ALLSTON
BRIGHTON
Project Area
SHREWSBURY
BROOKLINE
FRAMINGHAM
NEWTON
SOUTHBOROUGH
WELLESLEY
NATICK
BOSTON
WESTBOROUGH
NEEDHAM
ASHLAND
DEDHAM
SHERBORN
MILTON
HOPKINTON
DOVER
QUINCY
WESTWOOD
HINGHAM
BRAINTREE
HOLLISTON
WEYMOUTH
MEDFIELD
NORWOOD
CANTON
MILLIS
RANDOLPH
UPTON
MILFORD
MEDWAY
HOLBROOK
WALPOLE
NORTHBRIDGE
HOPEDALE
SHARON
AVON
STOUGHTON
NORFOLK
BELLINGHAM
UXBRIDGE
MENDON
FRANKLIN
WRENTHAM
FOXBOROUGH

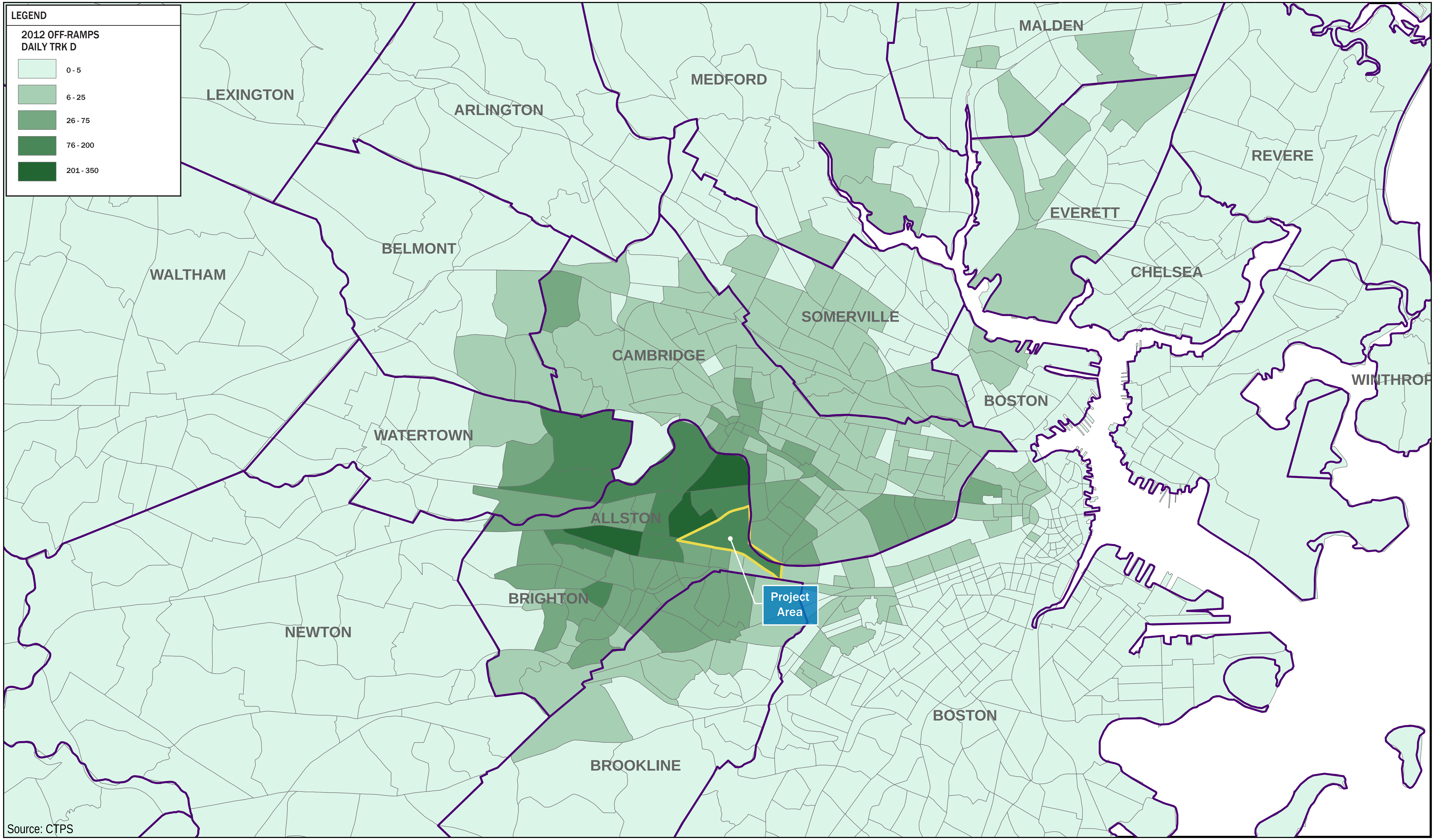
Source: CTPS 2013

I-90 Allston Interchange Project
Draft Environmental Impact Report

Not To Scale

FIGURE
4.8-5

Allston On-Ramps
Existing Traffic Destinations


LEGEND
2012 OFF-RAMPS
DAILY TRK D
0 - 5
6 - 25
26 - 75
76 - 200
201 - 350
LEXINGTON
ARLINGTON
MEDFORD
MALDEN
REVERE
EVERETT
CHELSEA
BELMONT
WALTHAM
SOMERVILLE
CAMBRIDGE
WINTHROP
BOSTON
WATERTOWN
ALLSTON
Project Area
BRIGHTON
NEWTON
BOSTON
BROOKLINE

Source: CTPS

N

Not To Scale

I-90 Allston Interchange Project
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FIGURE
4.8-6

Allston Off-Ramps
Existing Truck Destinations

0 500 1000

Feet

I-90 Allston Interchange Project
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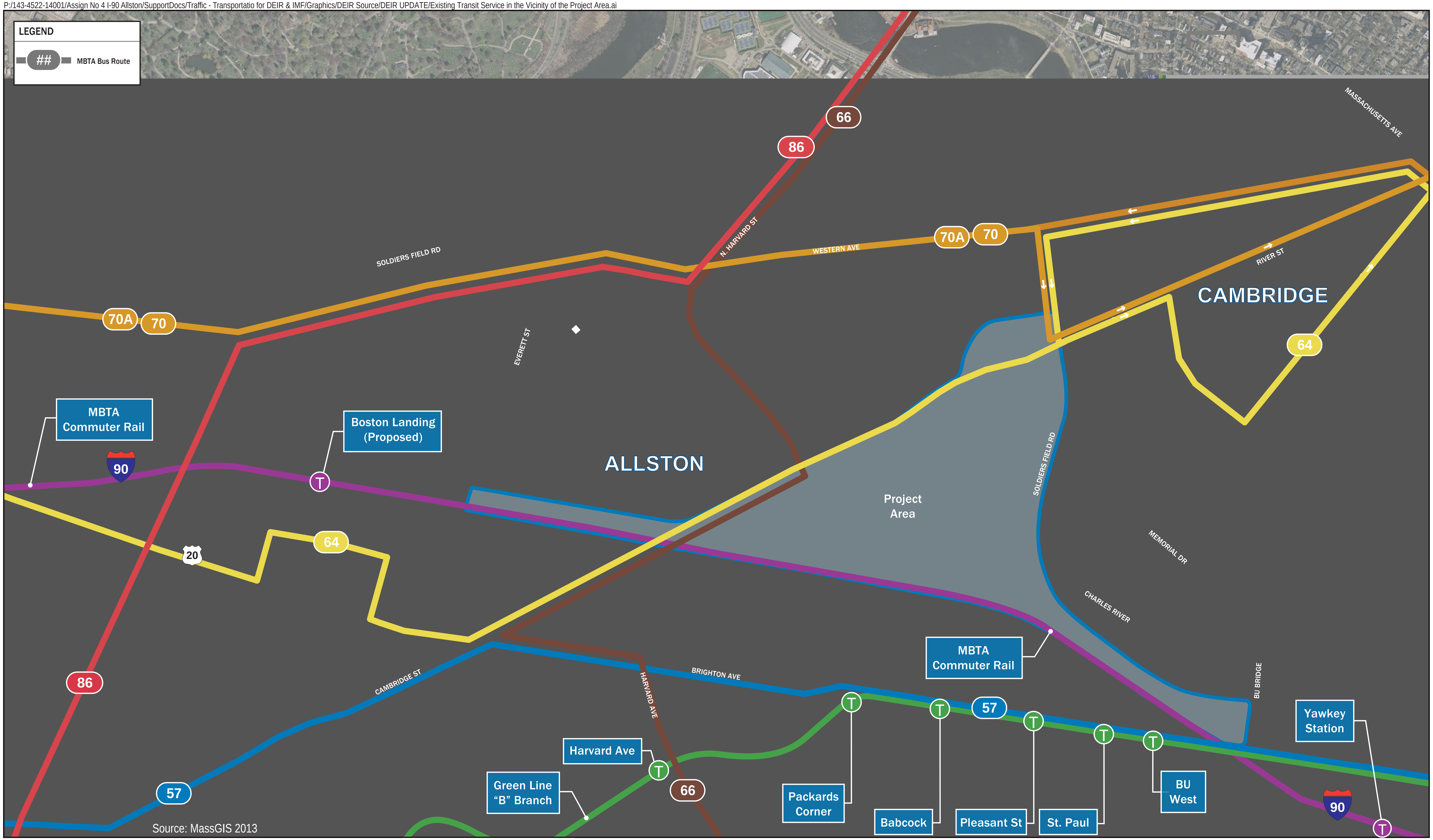
FIGURE

4.8-7

Primary and Secondary Traffic Study Area Intersections

P:/143-4522-14001/Assign No 4 I-90 Allston/SupportDocs/Traffic - Transportatio for DEIR & IMF/Graphics/DEIR Source/DEIR UPDATE/Existing Transit Service in the Vicinity of the Project Area.ai



LEGEND
## MBTA Bus Route
66
86
70A
70
64
57
90
20
SOLDIERS FIELD RD
N. HARVARD ST
WESTERN AVE
EVERETT ST
RIVER ST
MASSACHUSETTS AVE
CAMBRIDGE
ALLSTON
MBTA Commuter Rail
Boston Landing (Proposed)
Project Area
SOLDIERS FIELD RD
MEMORIAL DR
CHARLES RIVER
BU BRIDGE
CAMBRIDGE ST
BRIGHTON AVE
HARVARD AVE
MBTA Commuter Rail
Yawkey Station
Harvard Ave
Green Line "B" Branch
Packards Corner
Babcock
Pleasant St
St. Paul
BU West
T

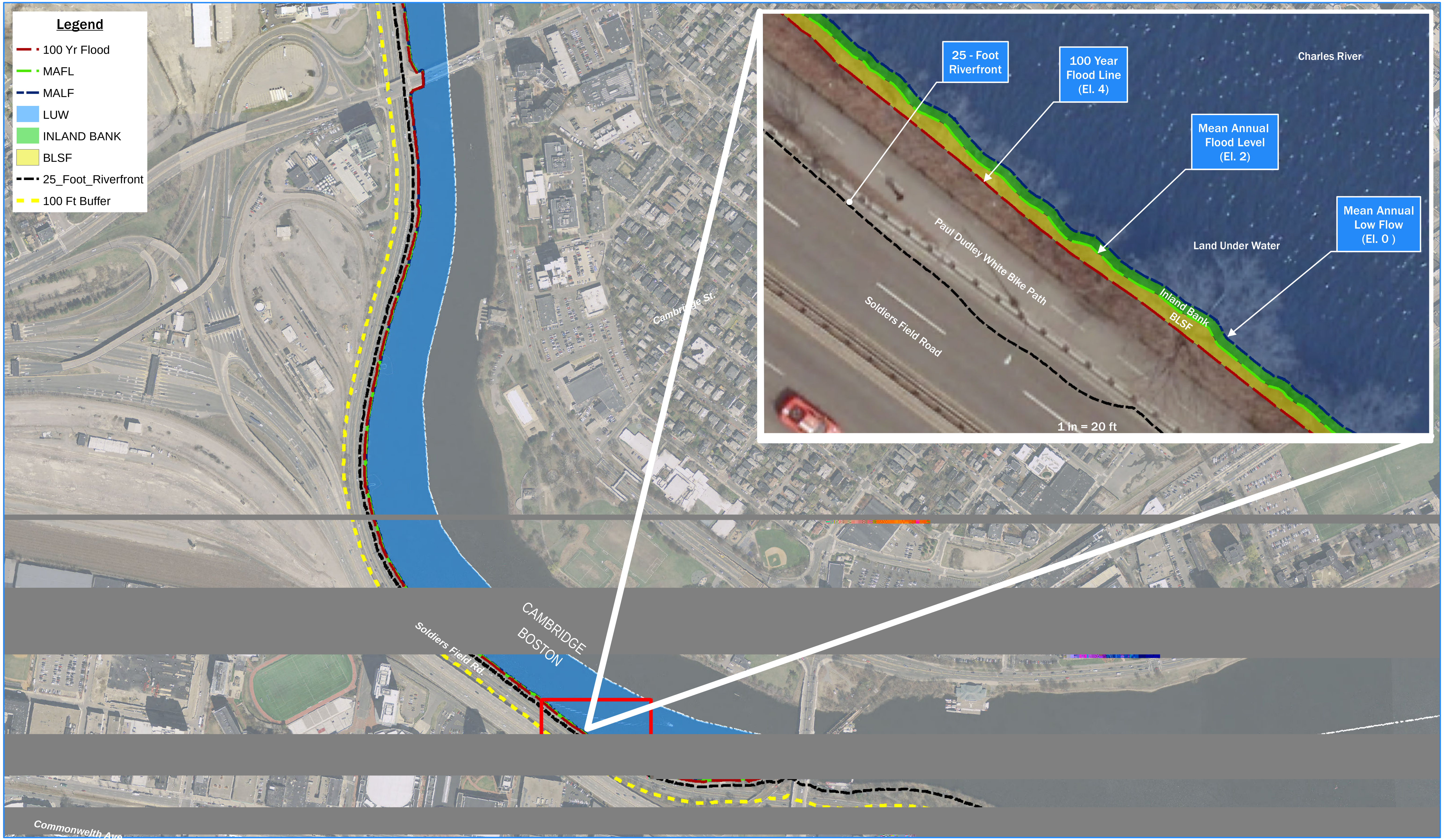
Source: MassGIS 2013

800 0 200 400 800
Approximate Scale in Feet

I-90 Interchange Allston, MA
Interchange Modification Report

FIGURE
4.9-1

Existing Transit Service in the Vicinity of the Project Area


Legend
100 Yr Flood
MAFL
MALF
LUW
INLAND BANK
BLSF
25_Foot_Riverfront
100 Ft Buffer
25 - Foot Riverfront
100 Year Flood Line (El. 4)
Mean Annual Flood Level (El. 2)
Mean Annual Low Flow (El. 0)
Charles River
Land Under Water
Paul Dudley White Bike Path
Soldiers Field Road
Inland Bank
BLSF
1 in = 20 ft
Cambridge St.
CAMBRIDGE
BOSTON
Soldiers Field Rd.
Commonwealth Ave

INTERSTATE 90 ALLSTON INTERCHANGE

massDOT
Massachusetts Department of Transportation
Highway Division

0 200 400
Feet

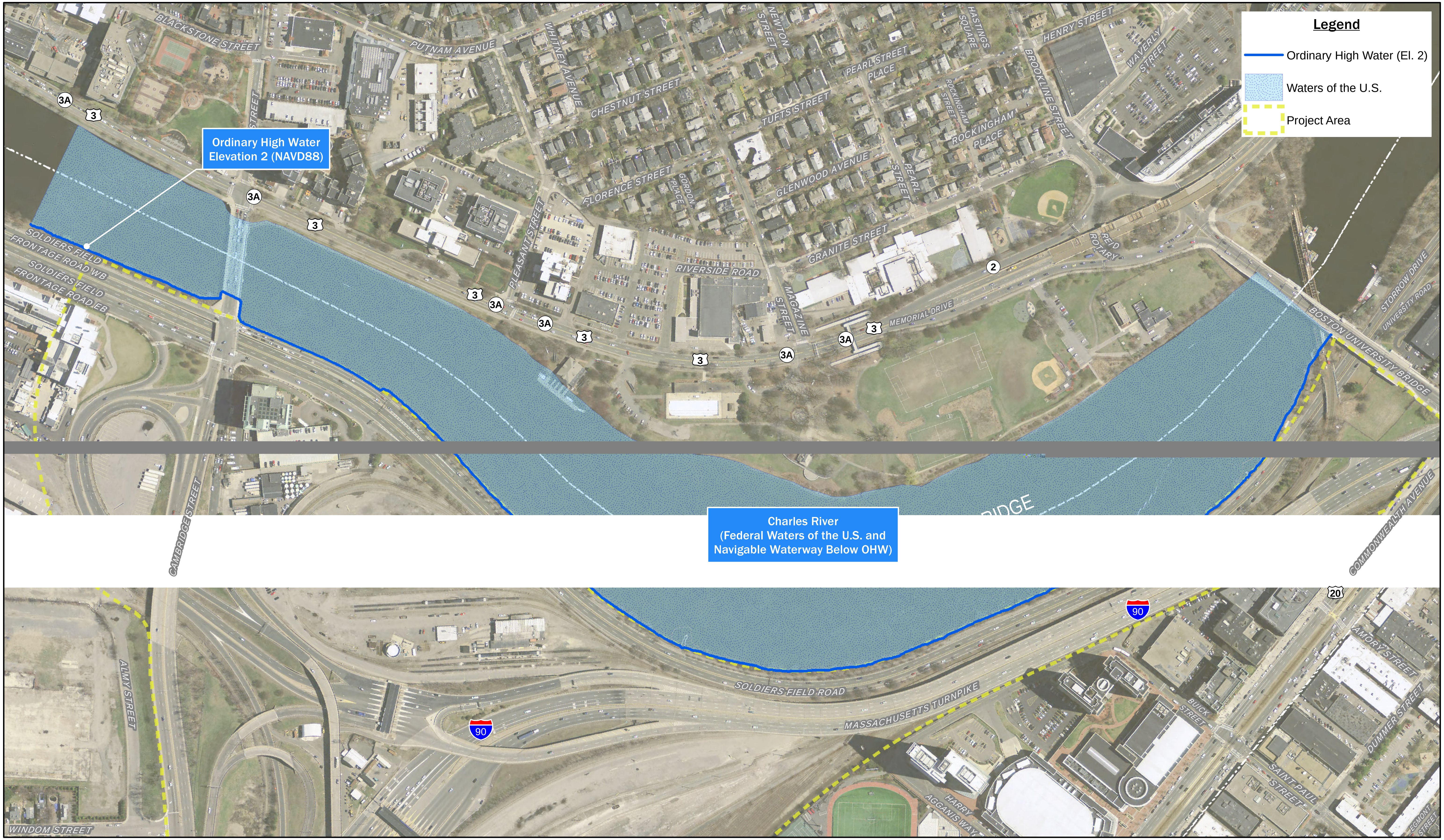
Notes:
1. Basemap Source 2013 USGS Aerial
2. All Elevations NAVD88 Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE

State Wetland Resources

4.12-1


Legend
Ordinary High Water (El. 2)
Waters of the U.S.
Project Area
Ordinary High Water Elevation 2 (NAVD88)
Charles River (Federal Waters of the U.S. and Navigable Waterway Below OHW)
BLACKSTONE STREET
PUTNAM AVENUE
WHITNEY AVENUE
CHESTNUT STREET
NEWTON STREET
HASTINGS SQUARE
PEARL STREET PLACE
TUFTS STREET
ROCKINGHAM STREET
ROCKINGHAM PLACE
BROOKLINE STREET
HENRY STREET
WAVERLY STREET
FLORENCE STREET
GORDON PLACE
GLENWOOD AVENUE
PEARL STREET
GRANITE STREET
RIVERSIDE ROAD
PLEASANT STREET
MAGAZINE STREET
MEMORIAL DRIVE
REID ROTARY
BOSTON UNIVERSITY BRIDGE
STORROW DRIVE
UNIVERSITY ROAD
SOLDIERS FIELD FRONTAGE ROAD WB
SOLDIERS FIELD FRONTAGE ROAD EB
CAMBRIDGE STREET
COMMONWEALTH AVENUE
BRIDGE
ALMY STREET
WINDOM STREET
SOLDIERS FIELD ROAD
MASSACHUSETTS TURNPIKE
BUICK STREET
AMORY STREET
DUMMER STREET
SAINT PAUL STREET
EGMONT STREET
HARRY AGGANIS WAY
3A
3
2
20
90

0 150 300
Feet

Notes:
1. Limit of Waters of the U.S. is OHW El. 2 (NAVD88)

I-90 Allston Interchange Project
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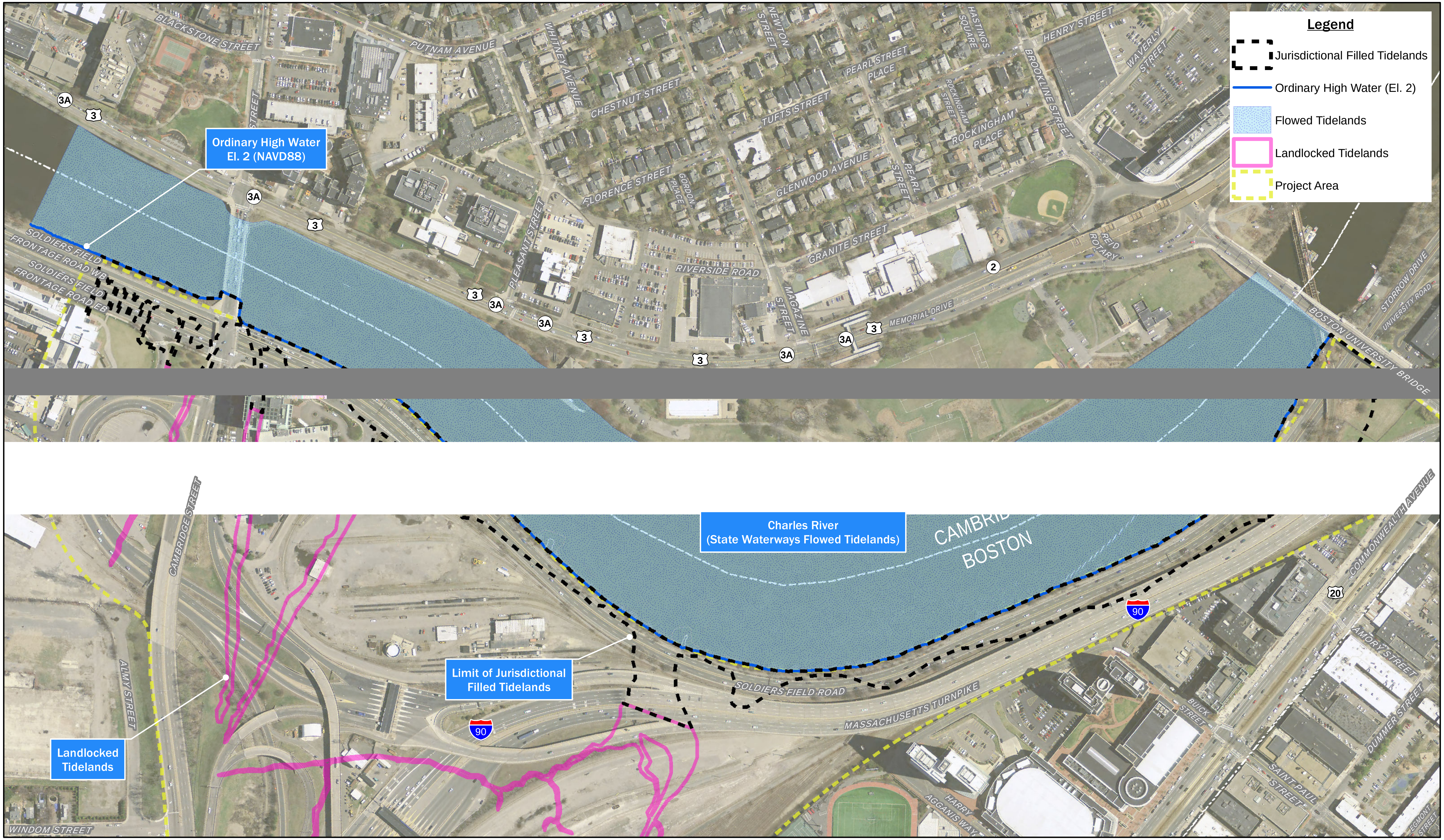
FIGURE
4.12-2

Federal Wetlands and Waterways Jurisdiction


Legend
Jurisdictional Filled Tidelands
Ordinary High Water (El. 2)
Flowed Tidelands
Landlocked Tidelands
Project Area
BLACKSTONE STREET
PUTNAM AVENUE
WHITNEY AVENUE
CHESTNUT STREET
NEWTON STREET
PEARL STREET PLACE
TUFTS STREET
HASTINGS SQUARE
ROCKINGHAM STREET
ROCKINGHAM PLACE
BROOKLINE STREET
HENRY STREET
WAVERLY STREET
FLORENCE STREET
GORDON PLACE
GLENWOOD AVENUE
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RIVERSIDE ROAD
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MAGAZINE STREET
MEMORIAL DRIVE
REID ROTARY
STORROW DRIVE
UNIVERSITY ROAD
BOSTON UNIVERSITY BRIDGE
SOLDIERS FIELD FRONTAGE ROAD WB
SOLDIERS FIELD FRONTAGE ROAD EB
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ALMY STREET
WINDOM STREET
SOLDIERS FIELD ROAD
MASSACHUSETTS TURNPIKE
COMMONWEALTH AVENUE
AMORY STREET
BUICK STREET
DUMMER STREET
SAINT PAUL STREET
EGMONT STREET
HARRY AGGANIS WAY
CAMBRIDGE
BOSTON
3A
3
2
90
20

Ordinary High Water El. 2 (NAVD88)

Charles River (State Waterways Flowed Tidelands)

Limit of Jurisdictional Filled Tidelands

Landlocked Tidelands

0 150 300
Feet

Notes:
1. Source - MassGIS Chapter 91 Data Layer
2. Limit of Flowed Tidelands is OHW El. 2 NAVD88

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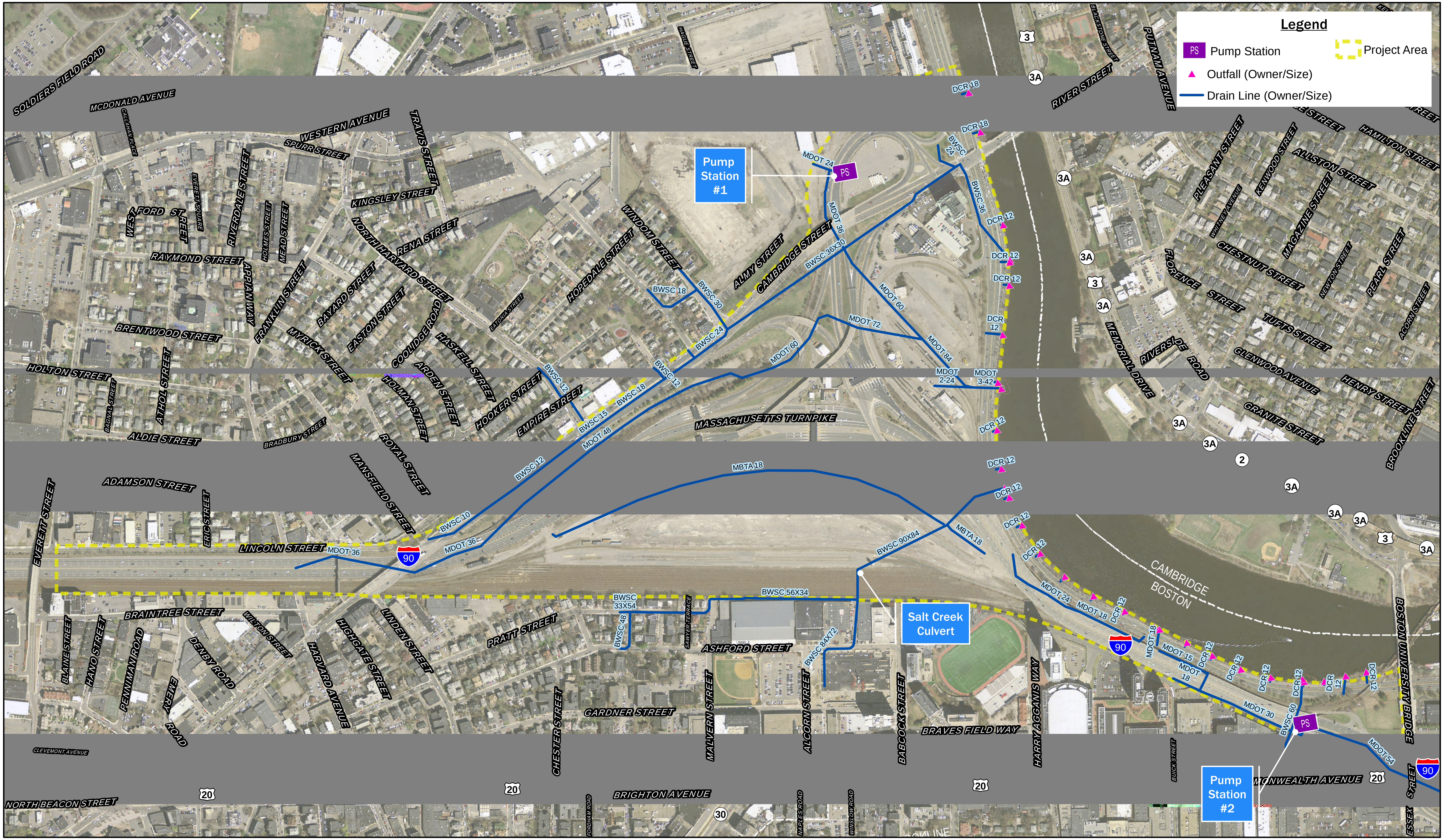
FIGURE

Chapter 91 Jurisdiction 4.12-3


Legend
PS Pump Station
Project Area
▲ Outfall (Owner/Size)
Drain Line (Owner/Size)
Pump Station #1
Pump Station #2
Salt Creek Culvert
PS
CAMBRIDGE
BOSTON
MASSACHUSETTS TURNPIKE
MDOT 24
MDOT 36
MDOT 60
MDOT 72
MDOT 84
MDOT 2-24
MDOT 3-42
MDOT 48
MDOT 18
MDOT 15
MDOT 30
MDOT 54
BWSC 18
BWSC 30
BWSC 24
BWSC 36X30
BWSC 12
BWSC 15
BWSC 10
BWSC 36
BWSC 90X84
BWSC 56X34
BWSC 33X54
BWSC 48
BWSC 84X72
BWSC 60
MBTA 18
DCR 18
DCR 12
SOLDIERS FIELD ROAD
MCDONALD AVENUE
WESTERN AVENUE
SPURR STREET
TRAVIS STREET
KINGSLEY STREET
NORTH HARVARD STREET
RENA STREET
WEST FORD STREET
RAYMOND STREET
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HENRY STREET
GRANITE STREET
BROOKLINE STREET
BOSTON UNIVERSITY BRIDGE
COMMONWEALTH AVENUE
ESSEX STREET
90
20
30
3
3A
2

0 250 500
Feet

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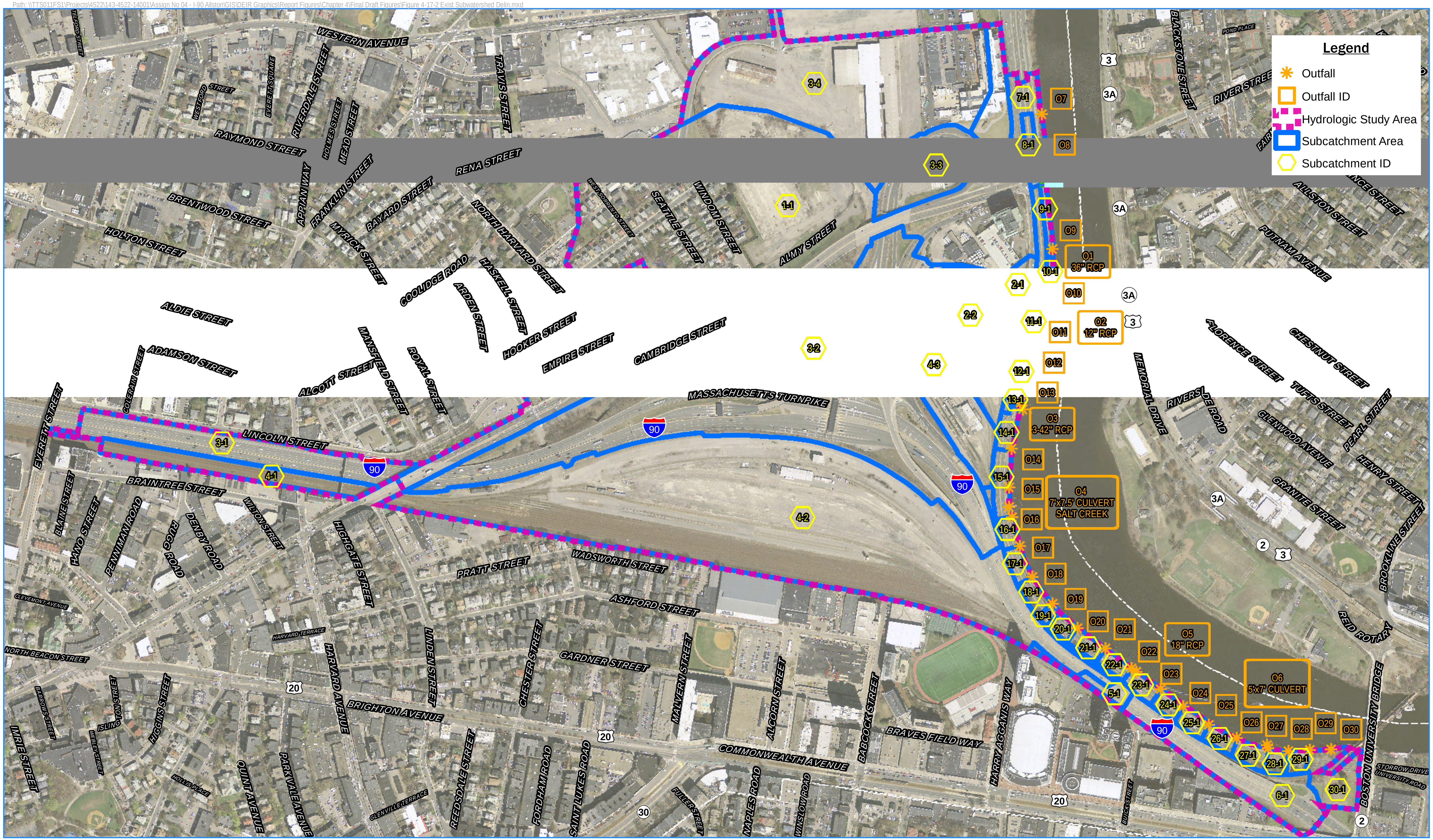
Note: All Drain Line Sizes are in Inches

FIGURE 4.17-1

Existing Drainage System

Date: 6/23/2017
Path: \\TTS011FS1\Projects\4522\143-4522-14001\Assign No 04 - I-90 Allston\GIS\DEIR Graphics\Report Figures\Chapter 4\Final Draft Figures\Figure 4-17-2 Exist Subwatershed Delin.mxd


Legend
Outfall
Outfall ID
Hydrologic Study Area
Subcatchment Area
Subcatchment ID
WESTERN AVENUE
TELFORD STREET
RAYMOND STREET
RIVERDALE STREET
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GARDNER STREET
MALVERN STREET
ALCORN STREET
BABCOCK STREET
BRIGHTON AVENUE
BRAVES FIELD WAY
HARRY AGGANIS WAY
COMMONWEALTH AVENUE
BARROWS STREET
ISLINGTON STREET
HIGGINS STREET
WEBLEY STREET
IMRIE STREET
HOLLIS PLACE
QUINT AVENUE
PARKVALE AVENUE
GLENVILLE TERRACE
REEDSDALE STREET
FORDHAM ROAD
SAINT LUKES ROAD
FULLER STREET
NAPLES ROAD
WINSLOW ROAD
BUICK STREET
BLACKSTONE STREET
POND PLACE
RIVER STREET
ALLSTON STREET
PUTNAM AVENUE
MEMORIAL DRIVE
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PEARL STREET
HENRY STREET
GRANITE STREET
BROOKLINE STREET
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BOSTON UNIVERSITY BRIDGE
STORROW DRIVE
UNIVERSITY ROAD
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90
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3-3
1-1
7-1
8-1
9-1
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12-1
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O7
O8
O9
O1
36" RCP
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12" RCP
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3-42" RCP
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O4
7'x7.5' CULVERT
SALT CREEK
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250
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Feet
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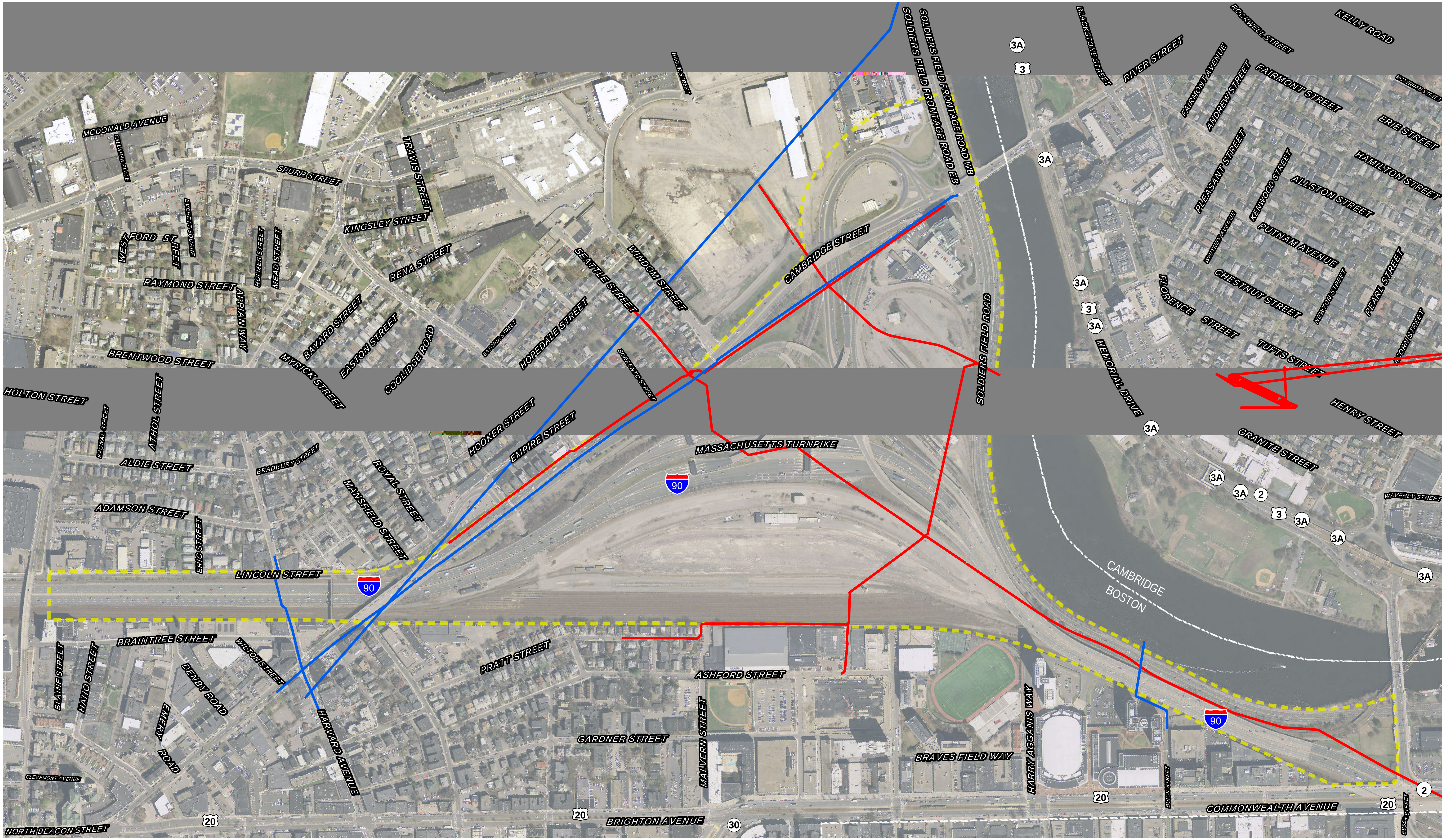
INTERSTATE 90
ALLSTON
INTERCHANGE

massDOT
Massachusetts Department of Transportation
Highway Division

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE

Existing Subwatershed 4.17-2


MCDONALD AVENUE
CALLAHAN PLACE
SPURR STREET
TRAVIS STREET
HAGUE STREET
SOLDIERS FIELD ROAD WB
SOLDIERS FIELD FRONTAGE ROAD EB
BLACKSTONE STREET
RIVER STREET
ROCKWELL STREET
KELLY ROAD
FAIRMONT AVENUE
ANDREW STREET
FAIRMONT STREET
MCTERNAN STREET
ERIE STREET
HAMILTON STREET
ALLSTON STREET
PLEASANT STREET
KENWOOD STREET
PUTNAM AVENUE
WHITNEY AVENUE
CHESTNUT STREET
NEWTON STREET
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DENBY ROAD
EMERY ROAD
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GARDNER STREET
MALVERN STREET
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HARRY AGGANIS WAY
BUICK STREET
ESSEX STREET
COMMONWEALTH AVENUE
CLEVEMONT AVENUE
NORTH BEACON STREET
BRIGHTON AVENUE
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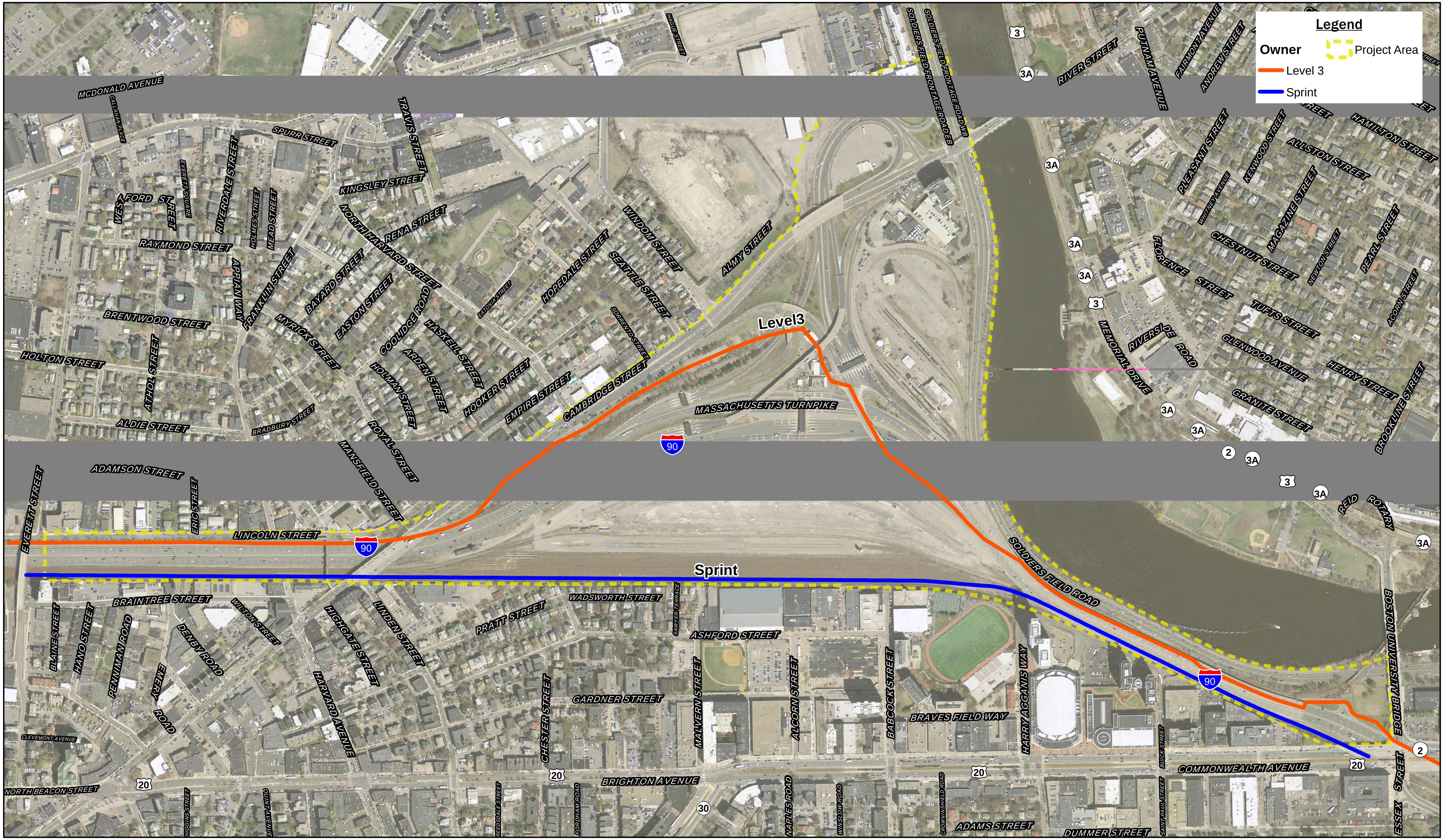
Legend
Owner
Project Area
Level 3
Sprint
Level3
Sprint
MASSACHUSETTS TURNPIKE
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MCDONALD AVENUE
SPURR STREET
TRAVIS STREET
KINGSLEY STREET
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WESTFORD STREET
RAYMOND STREET
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FAIRMONT AVENUE
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SAWYER TERRACE
ASHFORD STREET
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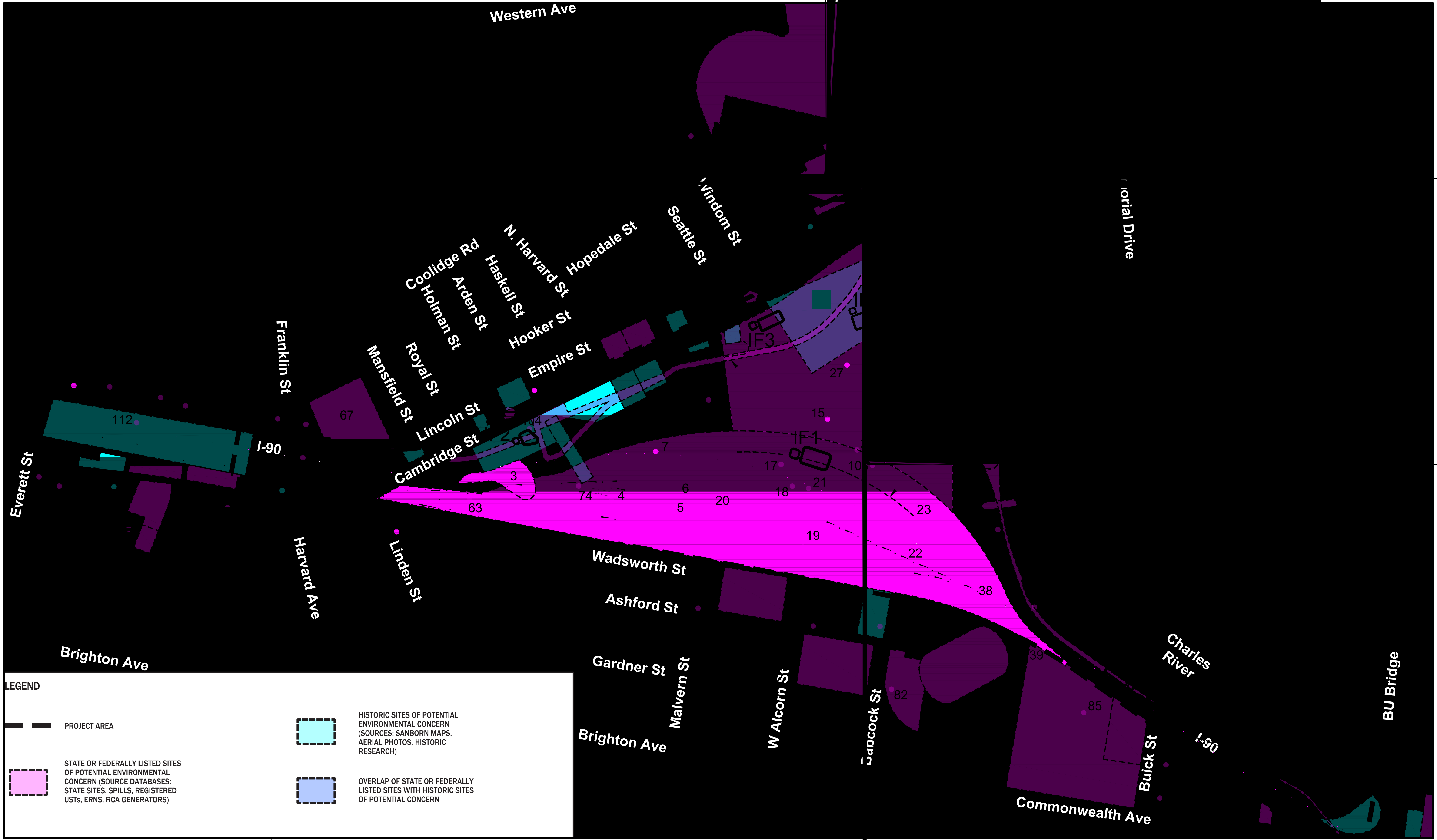
HANO STREET
PENNIMAN ROAD
DENBY ROAD
EMERY ROAD
HARVARD AVENUE
CHESTER STREET
GARDNER STREET
MALVERN STREET
ALCORN STREET
BABCOCK STREET
BRAVES FIELD WAY
HARRY AGGANIS WAY
COMMONWEALTH AVENUE
BRIGHTON AVENUE
NORTH BEACON STREET
CLEVEMONT AVENUE
NAPLES ROAD
ADAMS STREET
DUMMER STREET
ESSEX STREET
3
3A
2
20
30

I-90 Allston Interchange Project
Draft Environmental Impact Report

0 250 500
Feet

FIGURE

Communications 4.18-2


Western Ave
Windom St
Seattle St
Hopedale St
N. Harvard St
Coolidge Rd
Haskell St
Arden St
Holman St
Hooker St
Royal St
Empire St
Mansfield St
Franklin St
Lincoln St
Cambridge St
I-90
Everett St
Harvard Ave
Linden St
Wadsworth St
Ashford St
Gardner St
Malvern St
W Alcorn St
Babcock St
Brighton Ave
Commonwealth Ave
Buick St
Charles River
BU Bridge
orial Drive
112
67
104
3
7
74
4
6
5
20
18
17
21
10
15
27
23
19
22
38
39
63
82
85
IF1
IF3
LEGEND
PROJECT AREA
STATE OR FEDERALLY LISTED SITES OF POTENTIAL ENVIRONMENTAL CONCERN (SOURCE DATABASES: STATE SITES, SPILLS, REGISTERED USTs, ERNS, RCA GENERATORS)
HISTORIC SITES OF POTENTIAL ENVIRONMENTAL CONCERN (SOURCES: SANBORN MAPS, AERIAL PHOTOS, HISTORIC RESEARCH)
OVERLAP OF STATE OR FEDERALLY LISTED SITES WITH HISTORIC SITES OF POTENTIAL CONCERN
N
0
250
500
Feet

I-90 Allston Interchange Project
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FIGURE
4.20-1

Hazardous Materials Assessment Sites of Potential Concern

5 Assessment of Impacts

This chapter describes the impacts associated with the I-90 Allston Interchange Project with respect to the environmental resources discussed in Chapter 4. It documents the basis for determining and evaluating environmental impacts and also addresses the requirements specified in the Secretary's Certificate on the Project Environmental Notification Form (ENF). The information provided herein will be used to compare Project Alternatives and their impacts, and also to determine the potential measures for mitigating these impacts as required under federal and state regulations. Project mitigation for the I-90 Urban Interchange Preferred Alternative and the three Throat Area Variations is described in Chapter 7.

Review of Impacts

The following summarizes the impacts of the I-90 Urban Interchange Preferred Alternative and focuses on the impacts that differentiate the Throat Area Variations.

- **5.1 Geology, Topography and Soils –** Earthmoving will be required for the Preferred Alternative and all of the variations with negligible differences among them and no long-term impacts.
- **5.2 Land Use –** The Preferred Alternative will accommodate future potential development within the interchange street network area and air rights development. The Project will require right-of-way (ROW) acquisitions. The land area within the footprint of the proposed rail yard will not change from the existing rail use.
- **5.3 Visual –** The visual perspective of I-90 from Cambridge Street will change from a multi-level highway interchange to a walkable, future commercial or residential district. In Variation 3K-HV, the I-90 viaduct will remain approximately the same and will not change the existing visual character. 3K-AMP will slightly reduce the visual obstructions compared to existing conditions. 3K-ABC will improve views from the neighborhood to the Charles River. 3K-AMP and 3K-ABC locate the interstate highway right next to the historic Soldiers Field Road (SFR) Parkway and the Dr. Paul Dudley White Bike Path (PDW Path), changing the aesthetic character and views along the historic parkway.
- **5.4 Open Space and Recreation –** The Preferred Alternative provides enhanced opportunities for open space and recreation, both in conjunction with the interchange construction and potential future development. Variation 3K-HV will have the least amount of impact and create the second largest amount of new open space. 3K-AMP will have the second largest impact while creating the greatest amount of open space. 3K-ABC will have the greatest impact and create the least amount of open space.
- **5.5 Socioeconomic –** Positive socioeconomic effects will be created by the Preferred Alternative during construction and through improved access during operations. All three Throat Area Variations will largely have the same socioeconomic impact.
- **5.6 Historic –** Variation 3K-HV will have the least direct impact on historic resources; 3K-AMP will have the second most, and 3K-ABC the most. Both 3K-AMP and 3K-ABC will require replacement of the Grand Junction Railroad (GJR) Bridge over SFR. The proposed Franklin Street pedestrian bridge replacement will include a context-sensitive design approach to avoid any adverse effect on the Harvard Avenue Historic District.
- **5.7 Bicycle and Pedestrian Facilities –** The Preferred Alternative provides comprehensive inclusion of bicycle and pedestrian facilities including a new pedestrian bridge at Franklin Street that meets Americans with Disabilities Act (ADA) requirements. Variation 3K-HV provides a 12-foot-wide PDW Path in the Throat Area with additional space next to SFR for landscaping and an alignment that supports a connection to the future potential GJR path. 3K-AMP provides a 12-foot-wide path in a similar location to the existing PDW Path and adds an elevated shared-use path connecting directly from the West Station area to the PDW Path. 3K-ABC provides an 8.5-foot-wide PDW Path within the narrowest section of Throat Area. Variations 3K-AMP and 3K-ABC provide the opportunity to add a new PDW Path connection under the reconstructed GJR Bridge and existing Boston University (BU) Bridge. 3K-HV does not require reconstruction of the GJR Bridge, therefore, it does not include further realignment of SFR and the new PDW Path connection, but these elements are not precluded from occurring in the future.
- **5.8 Highway and Streets Safety and Operation –** The Project elements outside of the Throat Area improve safety, meet American Association of State Highway and Transportation Officials (AASHTO) standards and follow Complete Streets guidance. It will not preclude potential connections to Commonwealth Avenue. Within the Throat Area, Variation 3K-HV provides usable shoulders, stormwater collection areas, snow storage and access for vehicle recovery. It also meets applicable AASHTO standards. 3K-AMP and 3K-ABC do not satisfy AASHTO standards for at-grade interstate highways and do not provide the usable shoulder widths and associated safety-related benefits of 3K-HV.
- **5.9 Rail Operations –** The Preferred Alternative improves rail operations by providing layover tracks in the rail yard. It also improves rail transportation by providing the proposed West Station. In the Throat Area, Variation 3K-HV is consistent with existing conditions, with minor track adjustments. 3K-AMP elevates GJR on a viaduct, limiting available connections to the Worcester Main Line Track, and thereby reducing efficiency. 3K-AMP will result in slower Main Line track speed than the existing condition, while neither 3K-HV nor 3K-ABC will reduce track speeds on the Main Line. 3K-HV and 3K-ABC will allow crossovers between the Main Line and GJR tracks within the Throat Area to improve operational flexibility, while 3K-AMP will not allow these crossovers to be constructed.
- **5.10 Air Quality/Greenhouse Gas –** The Preferred Alternative and Throat Area Variations will ultimately result in lower emissions than existing conditions. No significant emissions differences are expected among the three variations.
- **5.11 Noise and Vibration –** Some noise impacts for the Preferred Alternative are predicted and noise walls in some areas outside of the Throat Area are anticipated. The three Throat Area Variations differ in that the elevated highway for 3K-HV provides some acoustic shielding to receptors in the PDW Path in the vicinity of the Throat Area. 3K-AMP and 3K-ABC lack this shielding, but provide some shielding from increasing the elevation of SFR eastbound.
- **5.12 Wetlands and Waterways** – The Preferred Alternative includes discharge pipes within the resource areas of the Charles River. Variations 3K-HV and 3K-AMP will have no alterations to resource areas. 3K-ABC will require the placement of the PDW Path within the resource areas of the Charles River. The Preferred Alternative and Variation 3K-ABC will impact Filled and Flowed Tidelands. Variations 3K-HV and 3K-AMP will impact Filled Tidelands.
- **5.13 Floodplain –** The Preferred Alternative will have de minimis impacts from discharge pipes in the Charles River. Variations 3K-HV and 3K-AMP will have no impact on floodplains. 3K-ABC will impact the floodplain from the retaining wall and associated fill within the resource areas of the Charles River.
- **5.14 Navigation –** There will be no impact to navigation from the Preferred Alternative and Variations 3K-HV and 3K-AMP. Variation 3K-ABC includes the PDW Path within the navigable waterway, but is not expected to interfere with navigation.
- **5.15 Fisheries –** There will be no impacts to fisheries associated with the Preferred Alternative and Variations 3K-HV and 3K-AMP. 3K-ABC includes the PDW Path within the river, resulting in impacts to the Banks Underlying the Anadromous/Catadromous Fish Run and associated fisheries habitat.
- **5.16 Threatened and Endangered Species –** No threatened or endangered species impacts are expected for the Preferred Alternative and Throat Area Variations.
- **5.17 Stormwater Management and Water Quality** – The Preferred Alternative and Throat Area Variations will meet regulatory stormwater standards. Variations 3K-AMP and 3K-ABC will require pumping of stormwater, will have constrained areas for stormwater treatment, and will not provide adequate shoulder width to prevent stormwater flow from encroaching into travel lanes. 3K-HV will not require stormwater pumping and it will maintain space for stormwater treatment, allowing for an exceedance of the phosphorus removal rate target.
- **5.18 Utilities –** Some utility relocation and upgrading will be required for the Preferred Alternative. A large diameter Massachusetts Water Resources Authority (MWRA) water main exists in the Throat Area and can remain in place under Variations 3K-HV and 3K-ABC, but will require relocation under 3K-AMP.
- **5.19 Climate Change –** Portions of the Project Area are predicted to periodically flood in the year 2070. While Variation 3K-AMP provides the greatest reduction in impermeable area, the differences among the variations are negligible with respect to climate change.
- **5.20 Oil and Hazardous Materials –** The Preferred Alternative and Throat Area Variations have some contaminated locations that will require specialized handling during construction. No significant differences exist among the three variations.
- **5.21 Construction Impacts –** Construction of the Preferred Alternative will be completed in multiple stages with highway traffic and commuter rail service maintained throughout the construction, although differences exist among the Throat Area Variations. Variation 3K-HV has the least highway operation and travel lane construction impact. 3K-AMP has a high impact, and 3K-ABC has an intermediate impact. Both 3K-AMP and 3K-ABC require the GJR Bridge over SFR to be reconstructed, which necessitates the closure of the GJR for a minimum of three years.
- **5.22 Construction Phasing and Cost –** MassDOT anticipates constructing the Project in three distinct phases. Cost varies among the variations with 3K-AMP being the most expensive, 3K-HV being the second most expensive, and 3K-ABC being the least expensive.
- **5.23 Environmental Justice –** None of the impacts of the Preferred Alternative and Throat Area Variations will have disproportionate adverse effects to environmental justice (EJ) populations.

Evaluation

The following table provides an evaluation summary for the No Build Alternative and the three Throat Area Variations of the I-90 Urban Interchange 3K Preferred Alternative. The impacts summarized in the preceding sections, and detailed in subsequent sections, are grouped together to form the criteria in the table below. A measurement for each criterion is defined, and references are provided for the document sections that describe in detail the impacts contributing to each criterion. Symbols indicating a determination of how completely each variation fulfills the criteria are assigned accordingly. These preliminary determinations were made considering the interchange as a whole including the features of each variation.

Variation Evaluation Summary

Criteria	Measurement	No Build	3K-HV	3K-AMP	3K-ABC
Mobility	Efficient movement of pedestrians, bicycles, buses, trains, and vehicles through the project area including West Station. (5.7, 5.8, 5.9, 5.21)	○	◒	◒	◒
Safety	Roadway and rail design that optimizes safety for all transportation modes. (5.7, 5.8, 5.9, 5.21)	🔴	◉	○	○
Traffic Operation	Mainline Interstate 90, ramps and street network that operate at an acceptable level of service. (5.8)	○	◒	◒	◒
Community Cohesion	Minimize traffic congestion on local streets, maintain community character and provide connections between key destinations, including allowances for connections to Commonwealth Avenue. (5.2, 5.3, 5.4, 5.5, 5.7, 5.8, 5.9, 5.11, 5.21)	🔴	◒	◒	◒
Future Development	Provide a core street network and infrastructure pattern that provides flexibility for a range of future development. (5.2, 5.4, 5.8)	🔴	◉	◉	◉
Railroad Operation	Provide all of the components necessary to support West Station and the South Station Expansion Program and GJR operations. (5.9, 5.21)	○	◉	○	◒
Cost	Construction cost, staging cost. (5.22)	◉	◒	○	◒
Schedule	Predicted timeframe for construction. (5.22)	◉	◒	○	◒
Compliance	Complies with Federal, State, and Local Regulatory Programs. (5.4, 5.6, 5.10, 5.11, 5.12, 5.13, 5.14, 5.15, 5.16, 5.17, 5.19, 5.20, 5.23)	◉	◒	◒	○

🔴 Does Not Achieve Criteria
○ Partially Achieves Criteria
◒ Adequately Achieves Criteria
◉ Provides Superior Achievement of Criteria

Safety, traffic operation and railroad operation are considered to be critical elements of the Project. The differentiating factors among the No Build and Throat Area Variations, and the justifications for the evaluation determinations assigned are:

- **Mobility –** All Throat Area Variations provide similar levels of enhanced mobility for pedestrians, bicyclists and mass transit, each with slight differences. Variations 3K-HV and 3K-AMP both provide a widened PDW Path in the Throat Area. 3K-ABC retains the existing path in the Throat Area, but creates the opportunity for, and does not preclude (as part of another project), additional pedestrian/bicycle connections over the Throat Area between the BU area and the Charles River. (However, those potential connections are not currently considered part of the Project.) 3K-AMP also provides an additional shared-use path along the elevated rail viaduct but creates complications with rail station efficiency. The No Build solely preserves existing connections.
- **Safety –** Safety is a critical element of the Project Purpose and Need and so is considered an important element of the Project. Variation 3K-HV offers direct benefits in safety by providing cross sectional width increases with usable shoulders to accommodate incident response, vehicle recovery and stormwater ponding control. The No Build, 3K-AMP and 3K-ABC maintain reduced travel lane and shoulder widths, thereby offering no similar safety benefits.
- **Traffic Operation –** Traffic operation is a critical element of the Project Purpose and Need and so is considered an important element of the Project. Adequate traffic operations are achieved by all variations. While the removal of the toll booths/plaza has yielded some improvement in Main Line traffic operations under the No Build, certain elements of the interchange still experience poor performance.
- **Community Cohesion –** Adequate community cohesion is achieved by all of the variations, since the majority of the interchange area affecting cohesion is essentially the same for all variations. The No Build does not achieve community cohesion since the existing ramp system and local roadway network would remain unchanged.
- **Future Development –** Future development is supported by all of the variations, since the majority of the interchange area affecting potential development is essentially the same for all variations. The No Build does not support future development since the existing ramp system and local roadway network would remain unchanged.
- **Railroad Operation –** Railroad operation is a critical element of the Project to support commuter rail service, the GJR, and operations of South Station. Variation 3K-HV is rated highest among the variations because it provides the most flexible railroad operations, with the lowest operational impact during construction. 3K-ABC is rated adequate because while providing many of the same benefits of 3K-HV, the position of the GJR structure reduces flexibility for track switching, and causes more significant construction phase impacts. 3K-AMP is rated lowest because it will result in lower Main Line track speeds, fails to allow flexibility between Main Line and GJR tracks, and creates significant construction phase impacts to railroad operations. The No Build is rated lower because it does not provide the upgraded rail yard or additional tracks and connectivity.

- **Cost –** Variations 3K-HV and 3K-ABC are rated as adequate because the costs for implementing both variations are estimated to be similar. 3K-AMP is rated lowest because its estimated cost is the highest. The No Build was rated highest because its estimated cost is lowest.
- **Schedule –** The No Build is rated highest because it offers the shortest time frame for construction. Variation 3K-HV and 3K-ABC are rated next because they have the mid-range estimated schedule. 3K-AMP is lowest because it has the longest estimated completion schedule.
- **Compliance –** Variations 3K-HV and 3K-AMP are rated equally because both create moderate levels of regulatory impact. 3K-ABC is rated lower because it creates more significant historic, wetlands and waterways impacts than the other variations. The No Build is rated highest because rehabilitation of the existing viaduct would have minimal regulatory impacts.

5.1 Geology, Topography and Soils

5.1.1 No Build

The No Build Alternative consists of the rehabilitation of the highway viaduct. Short-term impacts to the soil and topography will result from the use of the surrounding area as laydown/staging for the reconstruction. There will be no long-term impacts or changes to geology, topography and soil conditions as a result of the No Build. The embankments that support the I-90 Interchange and ramp system will remain.

5.1.2 I-90 Urban Interchange Preferred Alternative, All Throat Area Variations

For the I-90 Urban Interchange 3K Preferred Alternative and all three Throat Area Variations, there will be temporary impacts to geology and soils, but no long-term impacts. Long-term changes to topography will result from the removal of the embankments that support the existing I-90 Interchange and ramp system. New embankments to support the proposed Cambridge Street South and its intersecting streets (Seattle Street Connector, Cattle Drive Connector and East Drive Connector) will be located in the central portion of the Project Area. An additional embankment will be constructed just north of the rail lines to support the proposed I-90 eastbound off- and on-ramps. These embankments are shown in blue in Graphic 5.1-1.

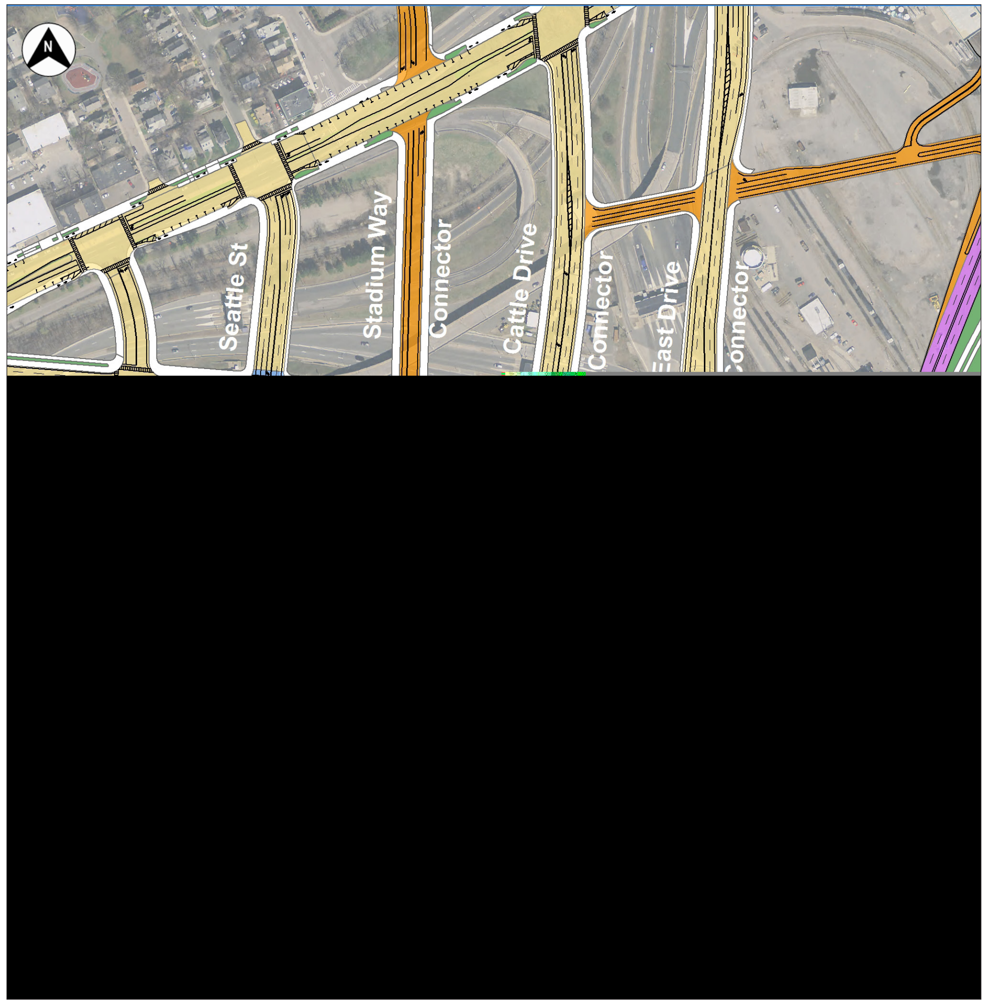
The same construction-term impacts will be associated with all three variations, requiring cuts along SFR to construct the underpass section of the roadway. The rail yard area requires 2- to 3-foot cuts. Variation 3K-AMP will require the deepest cuts in the area near BU to accommodate the depression of the Worcester Main Line. These cuts are needed to maintain the vertical clearance beneath the GJR viaduct.

Soil will be disturbed within the extent of the proposed highway and street construction. Existing highway and ramp embankments, retaining walls, utilities, drainage structures and elevated structures will be removed in a staged manner that maintains traffic through the Project. Construction of the proposed highway, ramp and street network will also require staged construction, including removal of pavement and soil, excavations for foundations and subsurface infrastructure, installation of temporary excavation support systems, and deep foundation installations with drilled shafts and piles. Topography will change with the removal of the existing highway and ramp embankments that support the existing I-90 Interchange.

No long-term impacts to Project Area soils will occur as a result of the Project. All areas exposed during construction will be stabilized with pavement and/or landscaped surface treatments including grass and mulch.

5.1.3 Rail Operations and West Station

Proposed rail operations and West Station will take place within the same areas that have historically been designated for railroad operations. Therefore, there will be no direct impacts to geology, topography and soils from the rail operations or West Station.



Graphic 5.1-1: Proposed Roadway Embankment Fill

5.2 Land Use and Zoning

This section describes the land use for the No Build and Future Condition. For the Future Condition, herein referred to as the 2040 Build, land use and transportation plans were reviewed to identify land use trends and planned developments, and to guide the Project design. Specific future development of the remaining parcels will be determined by Harvard University Beacon Yards, LLC, the owner of the land. They are not assessed as part of this Draft Environmental Impact Report (DEIR).

5.2.1 No Build

Within the Project Area and in the immediate vicinity of the I-90 Allston Interchange, it was assumed that development will occur by 2040 on land controlled primarily by Harvard University (i.e., Harvard's Allston Campus and proposed Enterprise Zone). The Allston Campus includes the parcels located north of Western Avenue and west of North Harvard Street that currently house several Harvard athletic facilities. The campus also includes land north of Western Avenue and east of North Harvard Street that houses the Harvard University Business School and other university facilities. The area bounded by Western Avenue, SFR, Cambridge Street and Windom Street, primarily vacant today except for the Genzyme facility, is planned to be Harvard's Enterprise Zone. It is assumed that development, or redevelopment, of these lands by Harvard will occur with or without the Project. Consequently, future development of these areas has been included in the 2040 No Build Alternative for this DEIR.

Under the No Build Alternative, the existing land uses in the Project Area will remain unchanged in the long term, but may be used as construction laydown/staging area while I-90 is reconstructed in the same footprint.

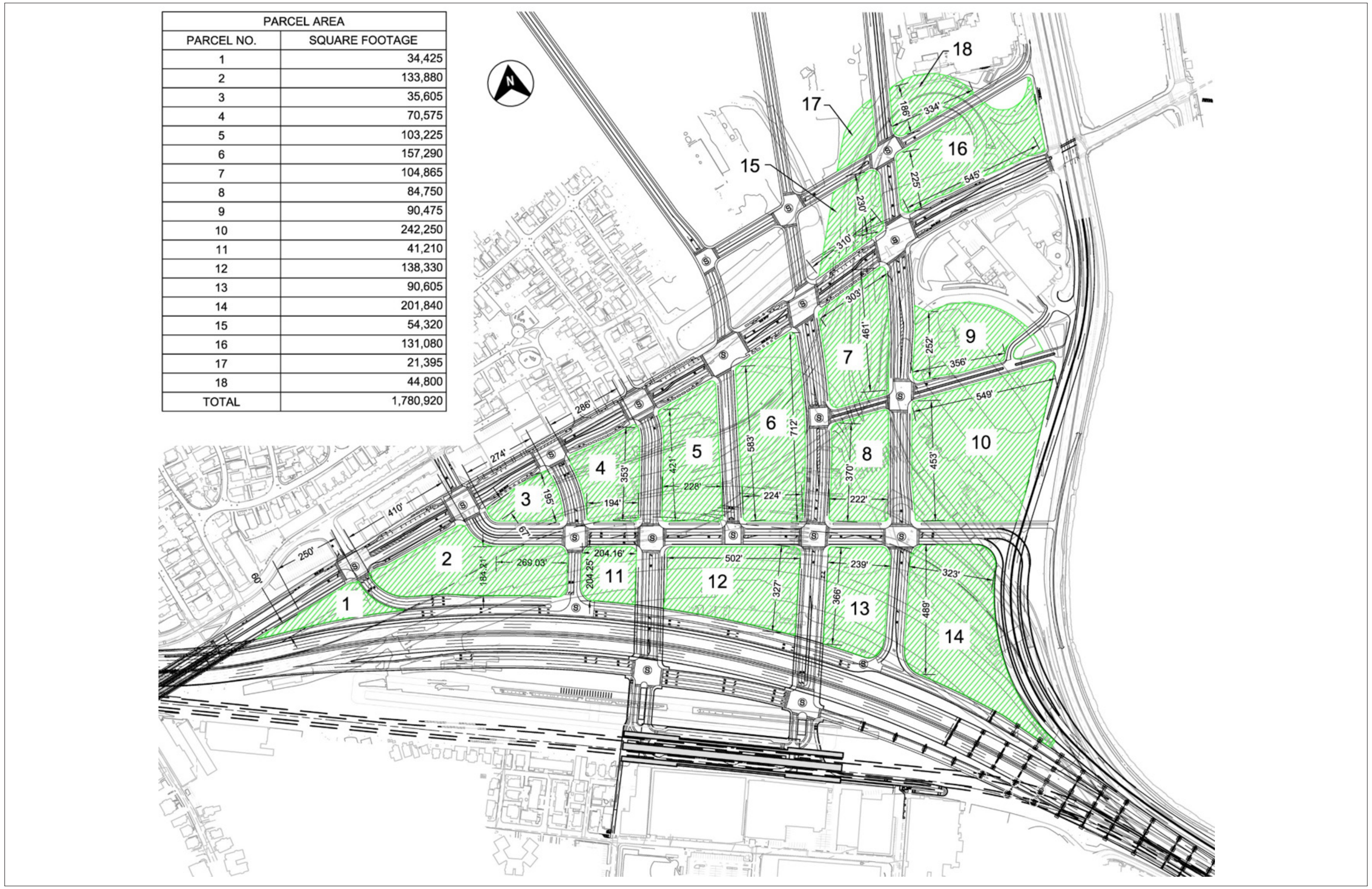
Rail Operations

Under the No Build Alternative, the existing land use within the rail yard and along the Worcester Main Line will continue to be used for rail transportation. Harvard University will retain the right to develop land above the rail yard. It is reasonably foreseeable that Harvard University will develop land for institutional, commercial or residential use above the existing rail yard under the No Build Alternative. Land development will likely occur around the Project Area as a result of natural population growth and economic activity. Under the No Build Alternative, the Massachusetts Bay Transportation Authority (MBTA) will continue to use the existing tracks within the MBTA easement for daytime layover use.

5.2.2 Future Land Use

In late 2013, Harvard University filed an Institutional Master Plan (IMP) with the City of Boston and a DEIR with the Massachusetts Environmental Policy Act (MEPA) that documented Harvard's proposed plan for the development/redevelopment of their Allston Campus and Enterprise Zone. In those documents, Harvard identified the size and type of development that is expected to occur within the Allston Campus and Enterprise Zone over the next 10 years.

In order to evaluate the transportation functionality of the various Allston Interchange Alternatives, (including the No Build Alternative), with a Design Year of 2040 (i.e., a 25-year planning horizon from 2015), it was necessary to develop 2040 land use projections for Harvard's Allston Campus and Enterprise Zone, as developed by Harvard. These development assumptions were then incorporated into the regional transportation demand model developed for the Project by the Central Transportation Planning Staff (CTPS).



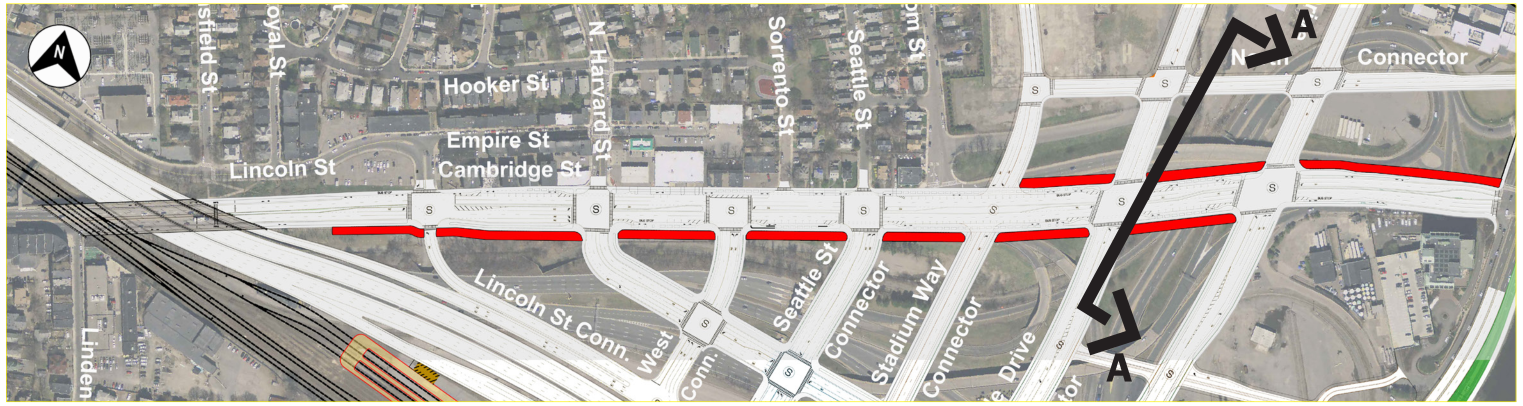
PARCEL AREA	
PARCEL NO.	SQUARE FOOTAGE
1	34,425
2	133,880
3	35,605
4	70,575
5	103,225
6	157,290
7	104,865
8	84,750
9	90,475
10	242,250
11	41,210
12	138,330
13	90,605
14	201,840
15	54,320
16	131,080
17	21,395
18	44,800
TOTAL	1,780,920

Graphic 5.2-1: Parcels Created by the I-90 Interchange Preferred Alternative Concept: Land formerly dedicated to highway and rail infrastructure is indicated in green.

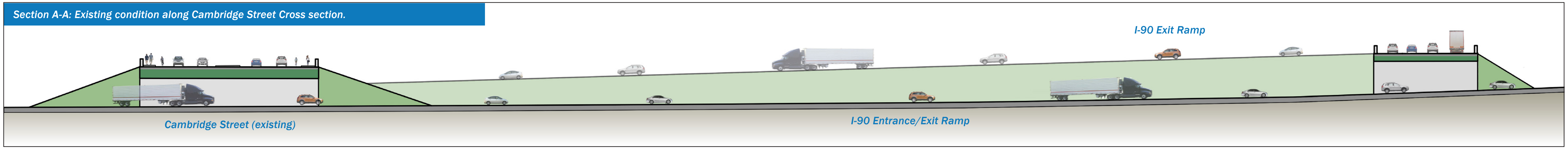
MassDOT consulted with Harvard University and CTPS to develop 2040 land use projections for lands controlled by Harvard in Allston, based on an interpolation of the projections developed by Harvard for the 10-year IMP. The 10-year IMP build-out of the Allston campus (beyond the Project Area) is expected to be comprised of approximately 1.3 million square feet of new development and 200 hotel rooms. The development will be comprised of primarily office or research and development space, with some retail and other space (academic/residential).

For the time period between completion of the 10-year IMP build-out and 2040, Harvard estimated that more than 1.7 million square feet of additional development will occur within the Allston Campus and Enterprise Zone (See Graphic 5.2-1.), resulting in a total 2040 build-out of approximately 2.9 million square feet. Using socioeconomic factors provided by CTPS, Harvard estimated that the 2.9 million square feet of development will result in approximately 7,000 new jobs and 1,200 new residents within the Allston Campus and Enterprise Zone. In total, (existing plus new), 9,200 jobs will be provided within these areas, and these areas will house approximately 4,400 residents. These employment and population forecasts were incorporated into the CTPS regional model for the 2040 No Build Alternative.

In addition to the development assumed for the Harvard University Allston Campus and Enterprise Zone, the 2040 No Build transportation model developed by CTPS also took into consideration employment and population changes expected by 2040 within the larger region outside of the immediate Project Area. Data related to these changes in employment and population were provided to CTPS by the Metropolitan



Graphic 5.2-2: Frontage Plan: Potential future development areas along Cambridge Street, enabling a two-sided street


Section A-A: Existing condition along Cambridge Street Cross section.

Section A-A: Potential future development along Cambridge Street and newly created parcels.
Cambridge Street
Potential Access Alley/Street
Hotel Lane

The realignment and vertical profile modifications of the roadway will change Cambridge Street from a one-sided street with homes and businesses on one side and earth berms and I-90 on the other side, into a two-sided street with development potential on both sides for approximately 2,000 feet

Area Planning Council (MAPC) and local planning agencies such as the Boston Planning and Development Agency (BPDA). As an example, the recently completed New Balance development project in Allston was included in all future year scenarios.

To a great extent, the evolution of the alternatives for the Beacon Park Yard (BPY) area was driven by land use considerations. Common to all three Throat Area Variations is a street pattern, I-90 Main Line/ramp alignment, and MBTA rail yard plan that reflects the input of many parties with a common goal of enabling a future mixed-use neighborhood connected to its immediate environment and to the regional transportation network, while also accommodating the Project's Purpose and Need. All roads proposed to be constructed as part of the Project have been developed in a manner to accommodate regional traffic and traffic associated with the potential redevelopment of the BPY. The City of Boston will review and approve all new streets to be under its control. In cases where I-90 ramp operations are a factor, the Massachusetts Department of Transportation (MassDOT) will review and approve accordingly. The I-90 Allston Interchange reconfiguration planning process will enable future development on a series of parcels, allow for the transformation of Cambridge Street, create open space along segments of SFR, and facilitate air rights development. In sum, the newly created development parcels and street grid, in combination with connections to the Charles River Reservation, I-90 and West Station, will be a framework for a new livable 21st century neighborhood that balances the regional transportation needs supported by the Project.

The following sections discuss the differences between the No Build and the I-90 Interchange Preferred Alternative and the three Throat Area Variations with respect to future land use.

5.2.2.1 I-90 Urban Interchange Preferred Alternative

The reconfigured highway interchange and straightened highway alignment will create an urban interchange that allows for the creation of developable lots by others to the north of the highway within BPY. The creation of these lots will allow the change in land use of this area from a highway use to institutional, commercial and residential use, consistent with the land use mix described in the Harvard University IMP.

The most significant change in land use within the Project will be the creation of developable parcels through the replacement of the existing I-90 Interchange and the construction of an urban street network within the same area. Graphic 5.2-1 shows the more than 1.7 million square feet of parcels created by the I-90 Preferred Alternative. The parcels are configured to accommodate various development scenarios and building footprints. The acreage of developable parcels will be maximized by relocating I-90 to the south, to the parcel formerly used as a rail freight-to-highway transfer facility, and by reconstructing the I-90 interchange in a split diamond configuration. By creating a street network, the existing land will be subdivided by proposed city street ROWs and proposed state highway ROW on land that is currently privately owned. Existing permanent utility easements will be retained within the proposed street network, I-90, SFR and the developable parcels. The extent of access restrictions along the highway ROW will be addressed as part of the Project development.

The reconfiguration of streets will allow Cambridge Street to be changed from a street with homes and businesses on one side and earth berms and I-90 on the other side into a street with development potential on both sides for approximately 2,000 feet. A frontage plan is provided in Graphic 5.2-2, along with two cross sections.

Land use impacts will include redistribution and creation of open space along segments of the SFR corridor from the GJR bridge to the Cambridge Street intersection. SFR will be re-aligned to move several feet towards the I-90 viaduct, which will create additional open space on the Charles River side of the roadway.

The existing exit ramp from SFR outbound (westbound) to Cambridge Street will be repurposed for open space. Use of the existing ramp for vehicular traffic will change to expanded use by pedestrians and bicyclists.

The Project will require a ROW acquisition for the construction of the Franklin Street pedestrian bridge replacement to the west of the Cambridge Street bridge. The preferred option for the bridge location will require an acquisition of the former Ace Ticket building and local business parking, and relocation of the businesses in the building.

Air Rights Development

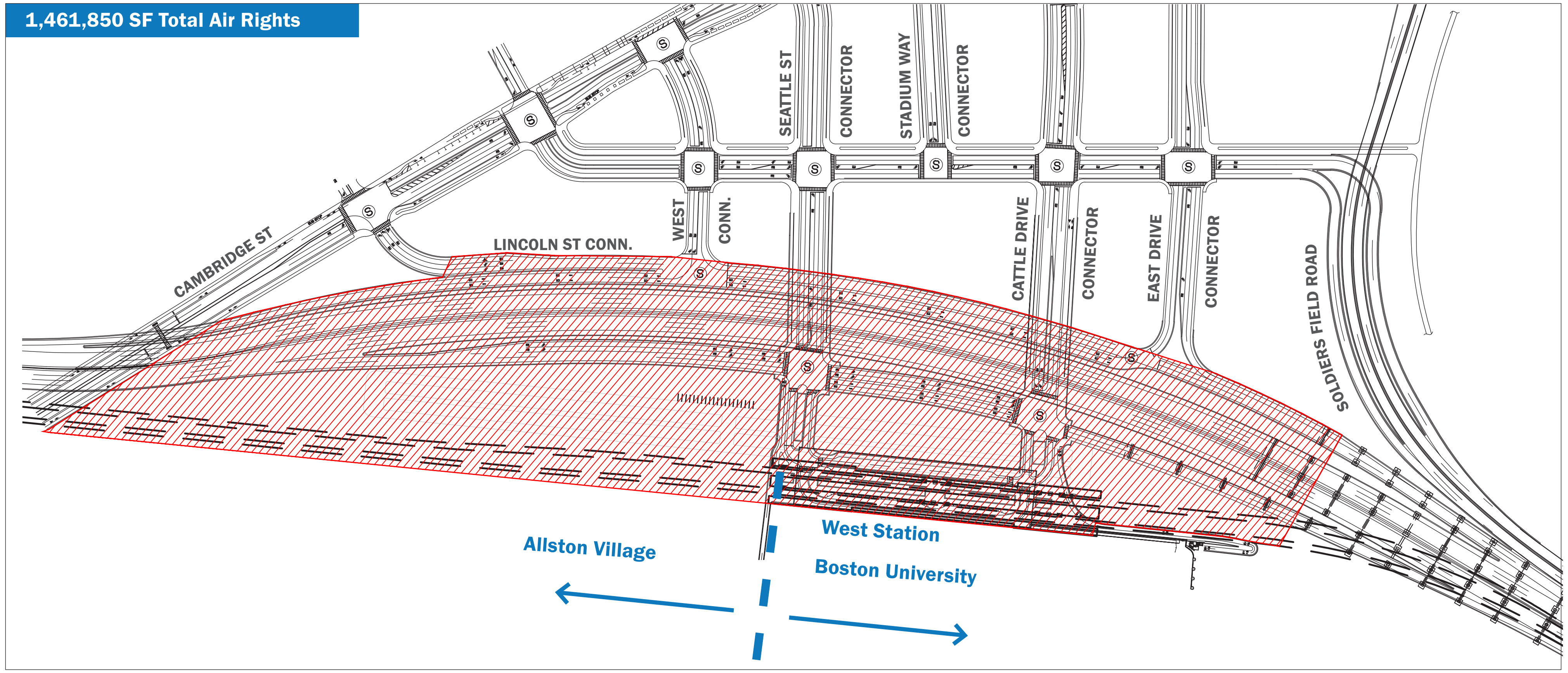
As shown on Graphic 5.2-3, there will be an approximate 1.5-million-square-foot (sf) area for potential air rights development over I-90 and the I-90 ramps connecting to the I-90 Urban Interchange Preferred Alternative street grid network, West Station, the MBTA commuter rail layover yard and the Worcester Main Line. Some percentage of this area will be required for general purpose roads and service roads and for open space, sidewalks, bicycle lanes and other highway requirements and constraints. Therefore, the available development footprint will be significantly smaller. Potential air rights development and transportation infrastructure will create a new edge along the south side of the Project Area for a distance of approximately 3,000 feet, where the railroad tracks interface with Allston Village and BU.

Provisions have been made for potential air rights development by aligning the rail tracks, rail facilities and access roads to accommodate columns 42-feet on-center between the track pairs spaced at 20-foot intervals east to west. The future developer will be responsible for maintaining existing commuter rail and freight rail operations and vehicular access to the railroad facilities. The developer will also be responsible for avoiding or relocating some large utilities that lie within the yard, such as the Salt Creek Culvert and an MWRA sewer line that borders the south side of the property. In addition, the developer will also be responsible for avoiding impacts to MassDOT's stormwater retention areas.

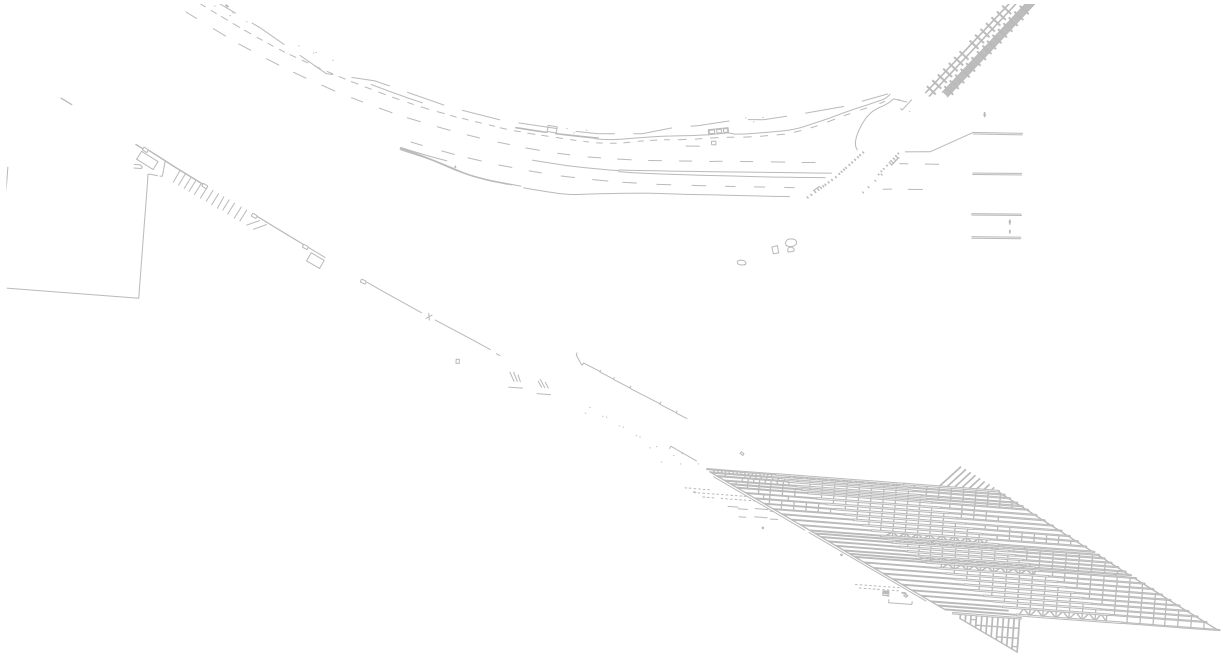
Air rights parcels along the northern edge could be accessed from Cambridge Street South if they are developed in tandem with the parcels immediately south of Cambridge Street South and north of the I-90 on and off ramps and frontage road, or from the adjacent development area.

At the northwest corner of Commonwealth Avenue and the BU Bridge, there is a parcel identified for future development in BU's IMP. See Graphic 5.2-4. Labeled as "Site 1," this parcel is composed of two pieces owned by BU and a piece owned by MassDOT, of which a large portion is an air rights parcel over I-90. Parcels 1 and 2 are owned by BU and Parcels 3 (potential air rights) and 4 are owned by MassDOT.

Potential development on these parcels will be possible in all three Throat Area Variations with access from either Commonwealth Avenue or the BU Bridge approach road. There will be a difference between the 3K-HV Variation and the 3K-AMP and 3K-ABC Variations with respect to first floor building variations. In the two latter variations, the I-90 profile will be lower than 3K-HV, allowing for a consistent first floor, grade-level floorplate throughout the site. The 3K-HV Variation profile rises as it emerges from under the Commonwealth Avenue Bridge. This will require a portion of the first floor floorplate to be elevated above grade. Development of the site will still be feasible, but this condition adds complexity to a potential building's access, first floor circulation and vertical circulation systems.



Graphic 5.2-3: I-90/Beacon Park Yards Air Rights Diagram



5.2.2.2 Future Ownership

Harvard University's existing land rights will change both temporarily during construction and permanently to implement the Project. Rights allowing MassDOT to construct the Project will be secured prior to construction. Proposed land ownership is anticipated, as follows, and is graphically illustrated on Figure 5.2-1 (provided at the end of the chapter).

DCR. The existing alignment of SFR changes between the GJR Bridge over SFR and the SFR underpass at River Street. Ownership of the land defined within the new SFR ROW and the land between SFR and the Charles River will change in fee from Harvard University to DCR. Ownership of the portion of Cambridge Street South that approaches and crosses the depressed section of SFR will also change in fee from Harvard University to DCR.

City of Boston. Cambridge Street is a City of Boston street. It will be widened to construct separated bicycle lanes, turn lanes and separated travel mode approaches at the intersections, parking and bus stops on both sides, sidewalks to current city standards, landscape strips, street lighting and other street amenities. The existing ROW on the southerly side of Cambridge Street must be extended to the south for these proposed features to remain within City of Boston jurisdiction. Similar to Cambridge Street, the proposed street grid between Cambridge Street and the ramps to and from I-90 will also be under City of Boston jurisdiction. New City of Boston ROW lines will be established at the back of sidewalks.

In addition, the City will require drainage easements, which will be established in coordination with Harvard University, for the conveyance of stormwater through a system of underground pipes to a new outfall at the Charles River. The City will also need to acquire a drainage easement from the newly established SFR ROW from DCR for this conveyance to the Charles River.

MassDOT. MassDOT must submit an Interchange Modification Report (IMR) to the Federal Highway Administration (FHWA) for approval that includes engineering justification for the proposed interchange reconfiguration. The report must document that the proposed modifications meet FHWA criteria, one of which stipulates that the interchange can only access public roads. To meet this criteria, the proposed new turnpike limits will match with the proposed City of Boston street ROWs. The new turnpike limits will be located to the outside limits of interstate structures, including foundations, to the outside limits of the eastbound and westbound exit and entrance ramps, including the frontage road links that are parallel to I-90 between the ramps, and to the outside limits of the connector street segments between I-90 and the southerly line of Cambridge Street South.

MassDOT will need to acquire the land occupied to the outside limits of the proposed pedestrian/bicycle bridge over I-90 to the west of the Cambridge Street bridge and the land occupied to the outside limits of the pedestrian/bicycle connectors to Malvern Street and to Babcock Street.

Permanent easements for the conveyance of stormwater drainage will be required through the most southeasterly parcel between East Drive and SFR, continuing through DCR land to a new outlet at the Charles River.

MBTA. The definition of MBTA's existing rights within the Project Area are expected to be refined to reflect future air rights for Harvard University, operating rights for Main Line tracks, and operation of the proposed layover yard. See discussion under Rail Operations.

Harvard University. Harvard University Beacon Yards, LLC owns the land between Cambridge Street and BU, with some of the land encumbered by highway and rail easements for I-90, the interchange, the Worcester Main Line tracks, and the southerly portion of the rail yard. To implement the Project, MassDOT will work with Harvard University to acquire rights to some of the land, as described above, and MassDOT will relinquish rights in lands it will no longer occupy. Harvard University will retain ownership of the parcels defined by the proposed street grid and air development rights over I-90, the interchange ramps, and all of the land to the south of the interchange ramps, subject to limitations that allow for the construction and operation of West Station and the layover yard, and the operation of the highway.

Rail Operations

In both the 2025 Opening Year and the 2040 Design Year, there will be a reduction in total acreage associated with the rail layover operations as compared to historic use. The proposed reconfiguration of the I-90 Allston Urban Interchange Preferred Alternative will straighten the highway alignment; the land on which the new highway will be constructed will be converted from railroad use to a highway use. The highway will be relocated to the recently vacated land between the existing rail yard tracks and the current highway alignment. As discussed in Section 4.2, Land Use, this vacant section of land between the existing rail-yard tracks and the current highway alignment was historically railroad use, but has since remained unoccupied. A portion remains improved with tracks, most of which are owned by MassDOT. The land area on which the proposed rail yard will be constructed will be significantly smaller in size than the area historically used for rail yard purposes.

The existing "MBTA Easement," discussed in Section 4.2, is based on an agreement that specifies the terms under which MBTA is permitted to maintain the two-track Worcester Main Line, and to construct and operate a layover rail yard on land owned by Harvard University. Approximately 135 feet in width, the existing easement will not provide sufficient space to construct the proposed yard and the proposed station. Consequently, the I-90 Urban Interchange Preferred Alternative will require MassDOT and Harvard University to renegotiate the terms of this easement or develop a new easement agreement, to provide sufficient space within which to construct the proposed rail yard and the proposed station adjacent to the Worcester Main Line.

The MBTA Easement also specifies that Harvard University reserves the air rights to use, or grant to others the right to use, the air space beginning 19 feet vertically above the top of the rail track in the MBTA easement area. The configuration of the I-90 Urban Interchange Preferred Alternative will not preclude the future installation of the structural support columns that will be needed, should Harvard University exercise the right to develop over the rail yard.

The I-90 Urban Interchange Preferred Alternative maximizes space for layover use in both the short- and long-term, while minimizing the overall footprint of the rail yard. In the 2040 Design Year, the rail yard will provide storage for eight train sets on four layover tracks and a commuter rail station.

West Station

The proposed commuter rail station will not be constructed as part of the initial build out. In the 2025 Opening Year, the Malvern Street pedestrian and bicycle bridge will be constructed over the Worcester Main Line, rail yard and I-90. The bridge will connect Malvern Street to a roadway constructed for the new interchange layout. (The functional characteristics of the access way are discussed in further detail in Section 5.7, Pedestrian and Bicycle.) The Malvern Street bridge will originate near the intersection of Ashford Street and Malvern Street near the edge of the BU campus. The Malvern Street bridge will require a partial property acquisition of the property located at 76 Ashford Street at the Malvern Street /Ashford Street intersection. MassDOT will require partial use of the property's paved driveway and parking lot area for construction of the Malvern Street bridge.

By 2040, West Station will be constructed adjacent to the Worcester Main Line and within the existing rail yard. Its construction will be consistent with the BPDA (formerly Boston Redevelopment Authority) Allston-Brighton Neighborhood District Plan. The Allston-Brighton Neighborhood District Plan establishes two Economic Development Areas (EDAs) within the Allston-Brighton Neighborhood District: the Allston Landing North EDA and the Allston Landing South EDA. The construction of West Station within the Allston Landing South EDA will be generally consistent with the plan's broad purpose of:

> *...encouraging economic growth, including manufacturing, commercial, and research and development activity, in a manner which is sensitive to the interests of the community; to provide for economic development that is of a quality and scale appropriate to the surrounding neighborhood; and to encourage the diversification and expansion of Boston's and Allston-Brighton's economy, with special emphasis on creating and retaining job opportunities.*

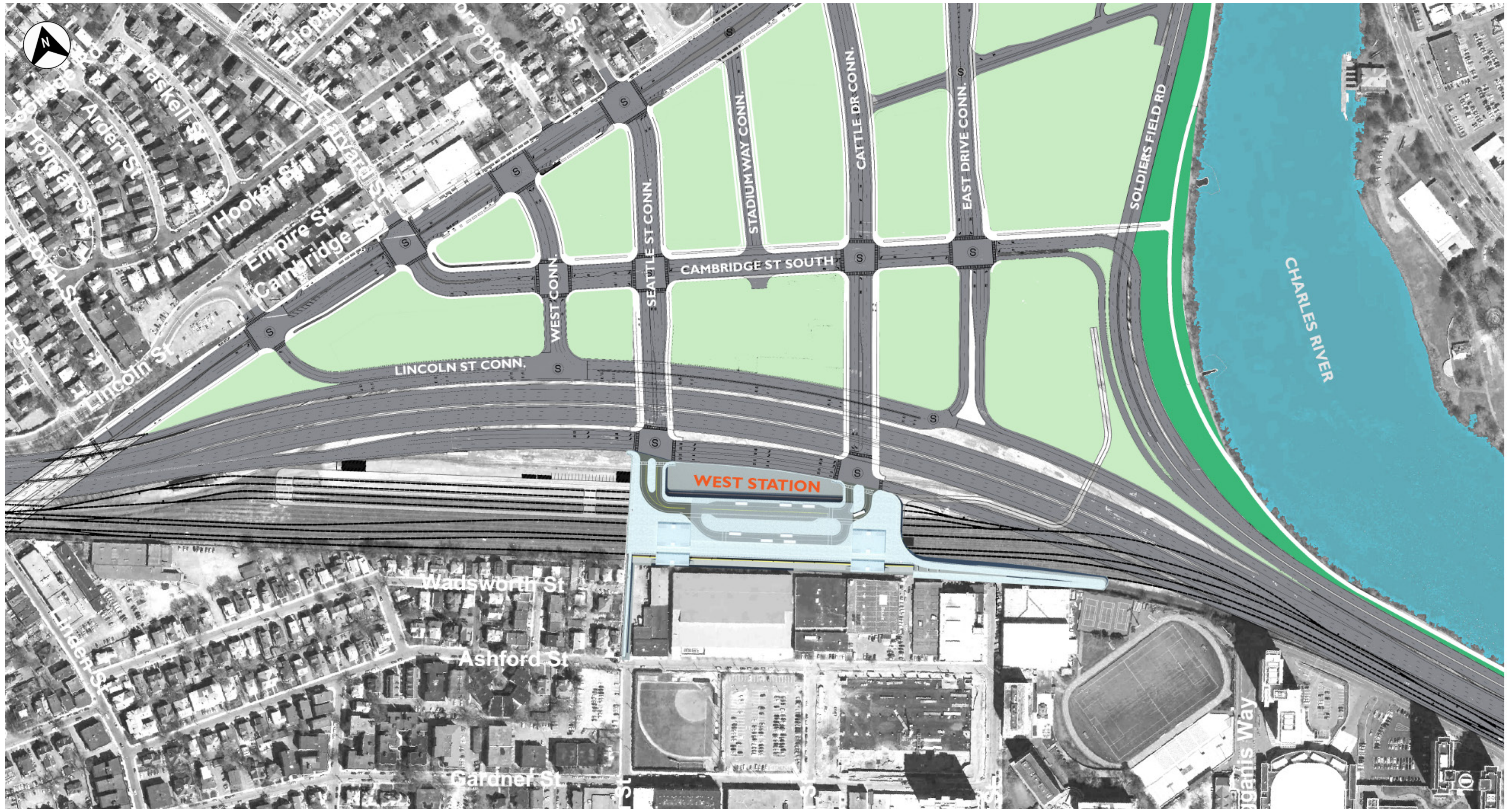
West Station will not change, or have an adverse effect, on the land use types within the Project Area. The land use will remain rail transportation-based. Moreover, land use will be consistent with the purpose of the Allston Landing South EDA. It will support future Harvard University developments over the proposed rail yard and to the north of the realigned I-90. It will also support the increased transportation demand that will result from the anticipated development. See Graphic 5.2-5.

The BU development in this area directly abuts the Worcester Main Line ROW. Therefore, shifting of the track curvature under Throat Area Variations 3K-AMP and 3K-ABC will require encroachment onto BU property by approximately 7 feet. BU property in this area includes existing parking, a parking structure, steam piping and a building fire escape.

5.2.2.3 Throat Area Variations

The Throat Area Variations comply with a number of goals set by the DCR's Charles River Basin Master Plan to varying degrees as described herein:

Provide better buffer between traffic and pedestrians
The 3K-HV Variation best provides a buffer in between traffic and pedestrians at the river's edge in the Throat Area. It is the only variation that allows more space for buffer plantings. The 3K-AMP Variation maintains the space close to what exists today (path is wider so buffer will be slightly less in some locations), and there will be an opportunity to replant the edge. 3K-ABC will not allow for a planted buffer.



Graphic 5.2-5: Plan view of West Station

Reinforce the parkway character of Soldiers Field Road
All Throat Area Variations improve the character of SFR where views of the expanded parkland will be created. As drivers descend through the underpass, they will experience a tunnel rather than the views of the river, and the parkway character will be diminished in the underpass section. As noted above, the 3K-HV Variation creates the most significant planted area at SFR westbound in the Throat Area. However, drivers in both directions will be affected by the height and proximity of the viaduct to a greater extent than in the 3K-AMP Variation, which is lower and therefore will have less of an impact. The 3K-ABC Variation will not allow for planted edges in the narrowest section of the Throat Area, which will be a reduction of parkway character.

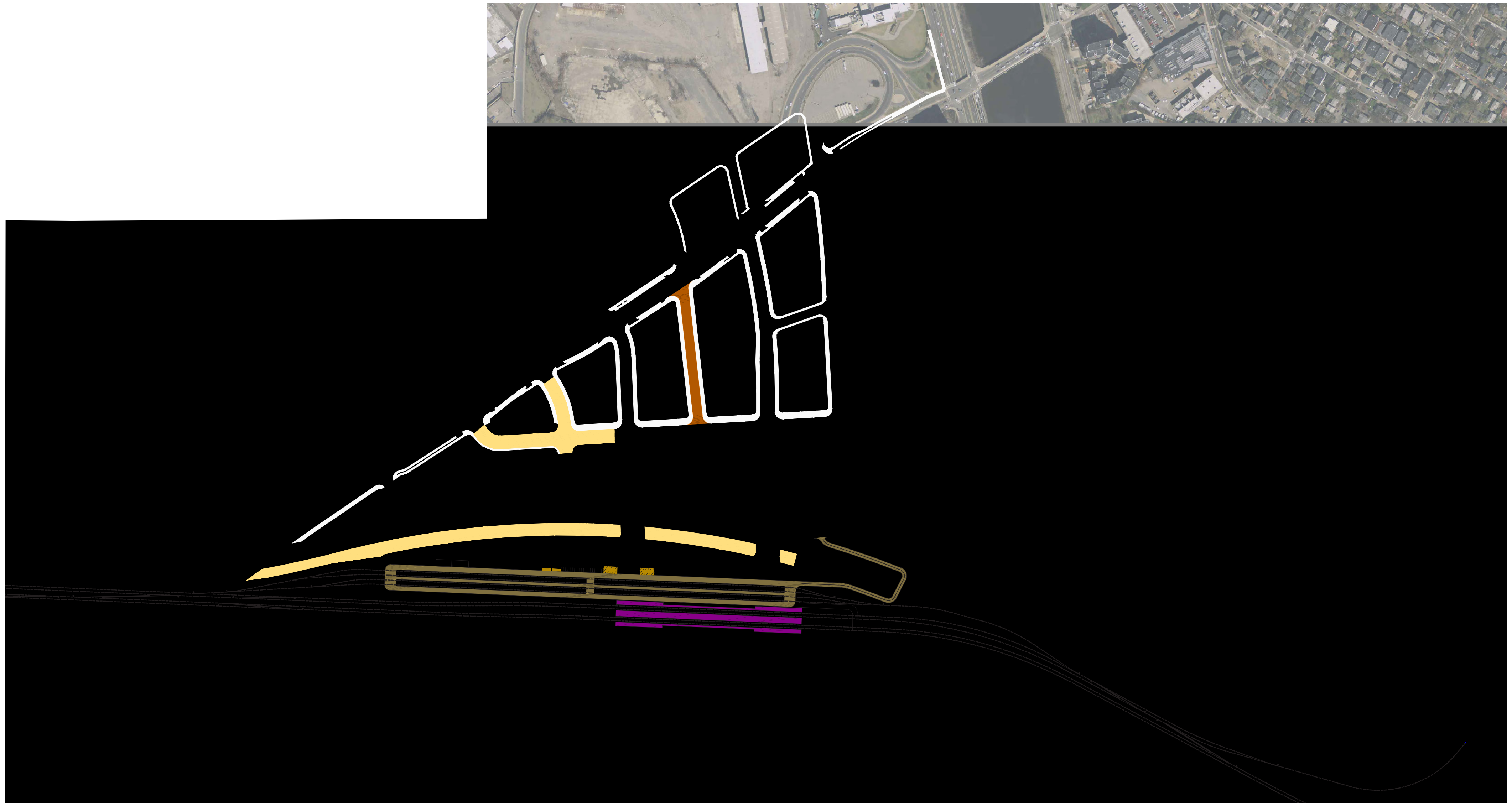
Gradually replace the green ash trees with a better performing tree
Both the 3K-HV and 3K-AMP Variations allow for the replacement of trees. The 3K-ABC Variation does not allow for replacement to the same extent.

Plant additional trees, including evergreens, along I-90 to help reinforce the parkway character of SFR
None of the Throat Area Variations allow for tree plantings at the edge of I-90. Improvements will be made to the underside of the viaduct variations to improve the character of SFR particularly heading eastbound.

Clear additional vistas along the bank, possibly in conjunction with providing access to the water's edge, to relieve the monotony of the long stretch
All Throat Area Variations will allow for additional vistas, and the newly developed park land will greatly relieve the monotony. The 3K-ABC Variation best addresses long views as the elevation of I-90 will be lower in comparison to the 3K-HV and 3K-AMP Variations; this affects views within the Project Area as well as views from other locations such as Cambridge.

Widen the PDW Path approach to the River Street Bridge and provide smooth continuous pavement
For all Throat Area Variations, the PDW Path to the River Street Bridge will be widened through the elimination of the vehicular approach ramp and its replacement with separated bicycle and pedestrian paths, and plantings.

Restore and realign the River Street Bridge
The River Street Bridge is not included in this scope of work.



5.3 Visual

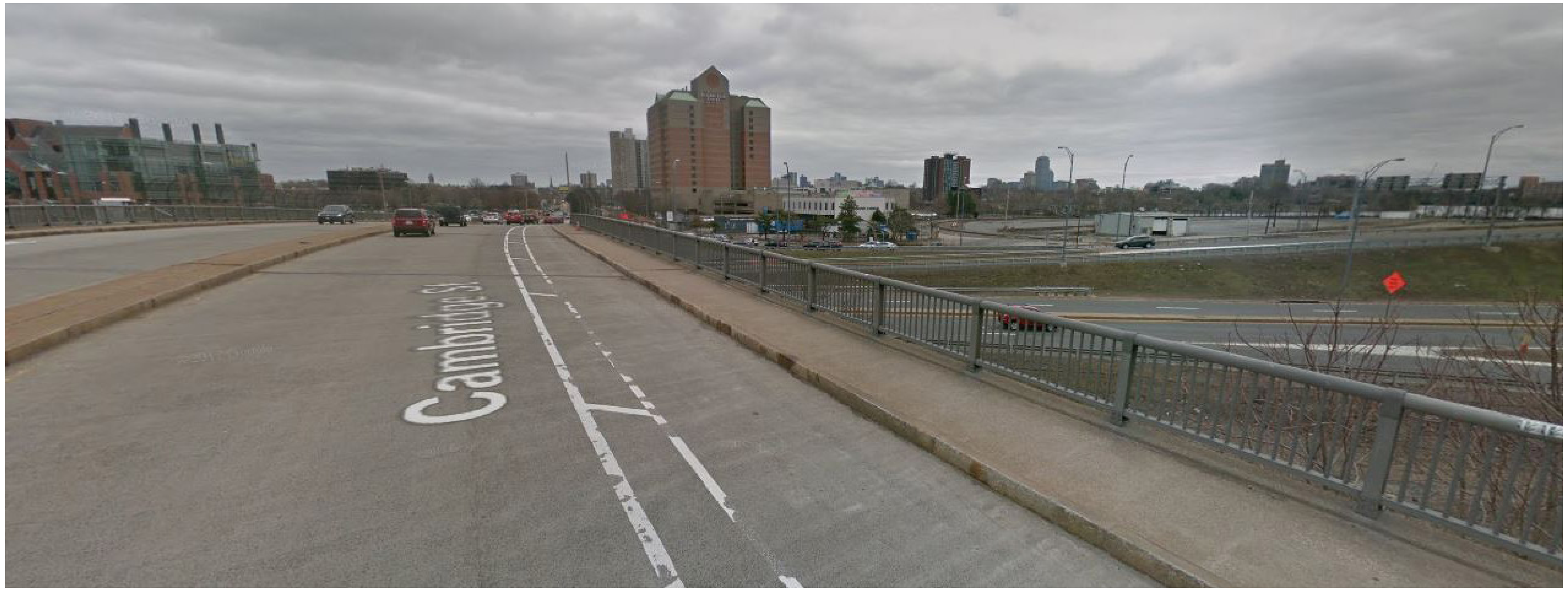
The following section discusses visual impacts associated with the Project.

5.3.1 No Build

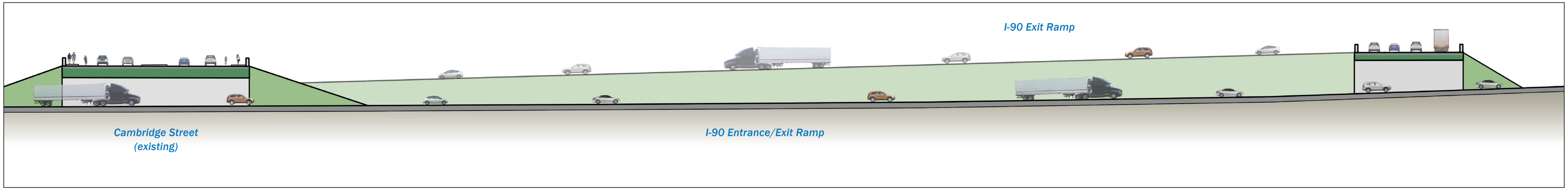
For the I-90 Urban Interchange and rail operations under the No Build Alternative, the visual and aesthetic conditions within the Project Area will remain unchanged. The views to and from the existing I-90 viaduct will remain unchanged. The Worcester Main Line will operate without a stop at this location, and the rail yard will be used for layover of up to eight train sets.

5.3.2 I-90 Urban Interchange Preferred Alternative Street Views

The visual environment in and around the Project Area will be dramatically altered by the Project. Annotated Graphic 5.3-1 is a key plan showing the locations where views will change within the Project Area. For the I-90 Urban Interchange Preferred Alternative, locations outside of the Throat Area will be the same as described below.

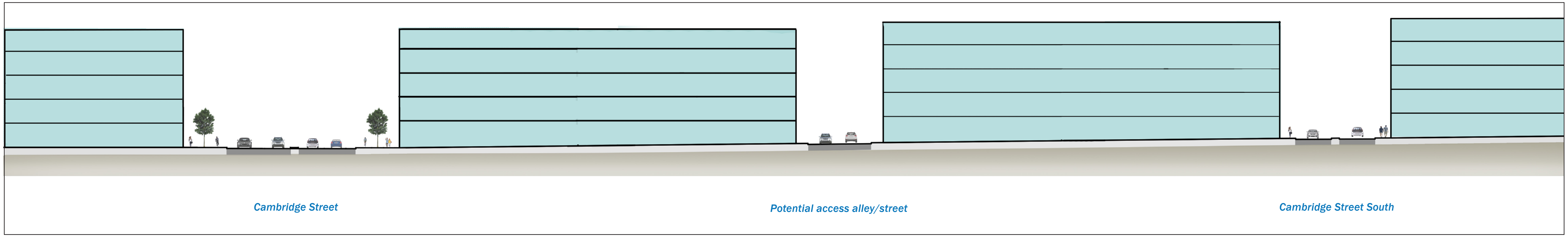


INSERT 4-1: Existing view from Cambridge Street overpass from Google Earth, sections below



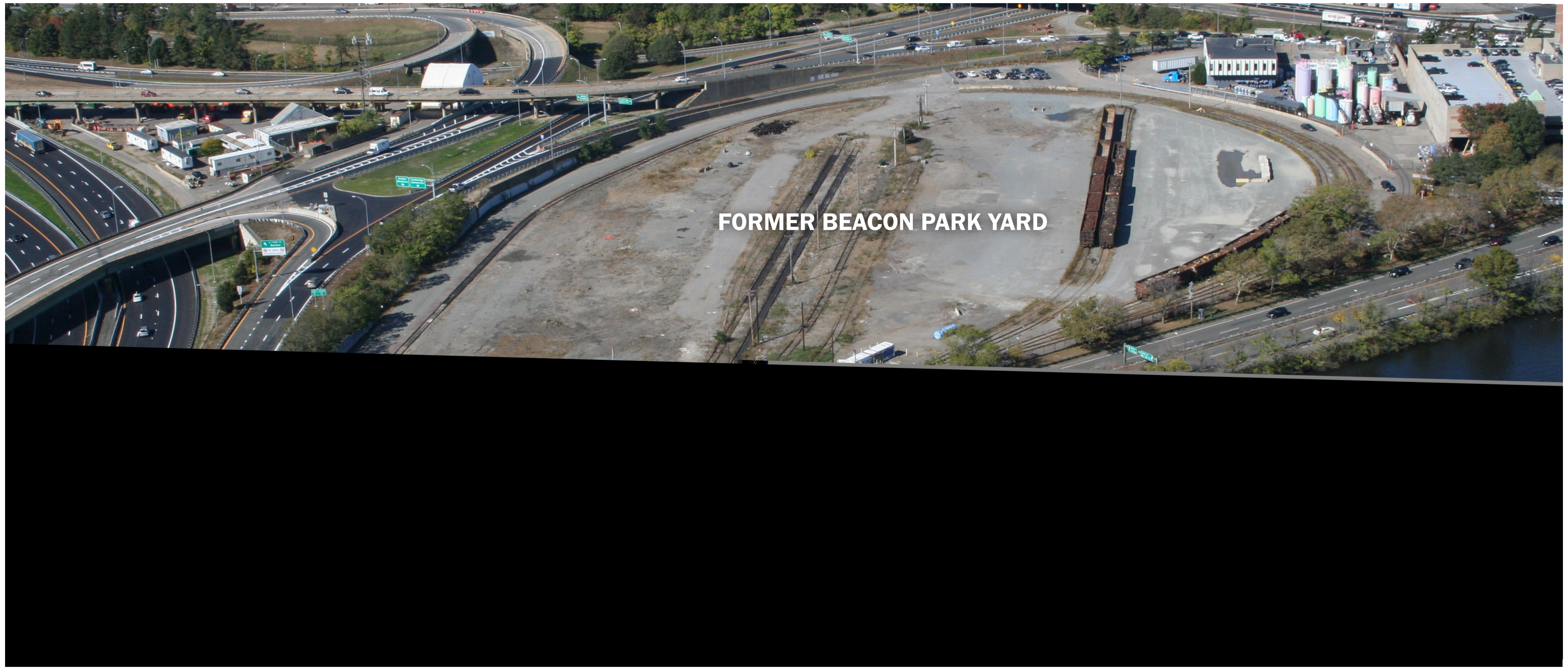
I-90 Exit Ramp
Cambridge Street
(existing)
I-90 Entrance/Exit Ramp

INSERT 4-2: Existing Cambridge Street Cross section (A-A), along the MassDOT right-of-way

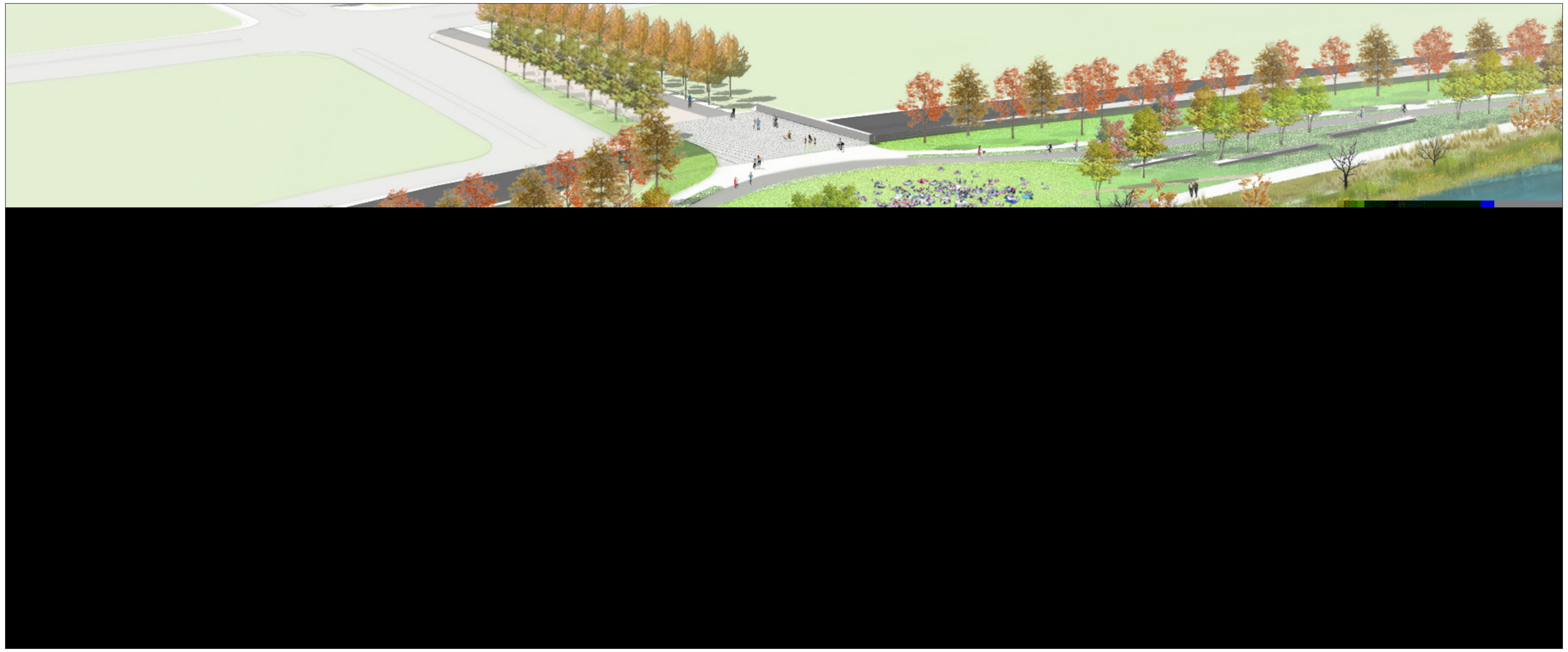


Cambridge Street
Potential access alley/street
Cambridge Street South

INSERT 4-3: 2040 Cambridge Street Cross section (A-A), along the MassDOT right-of-way

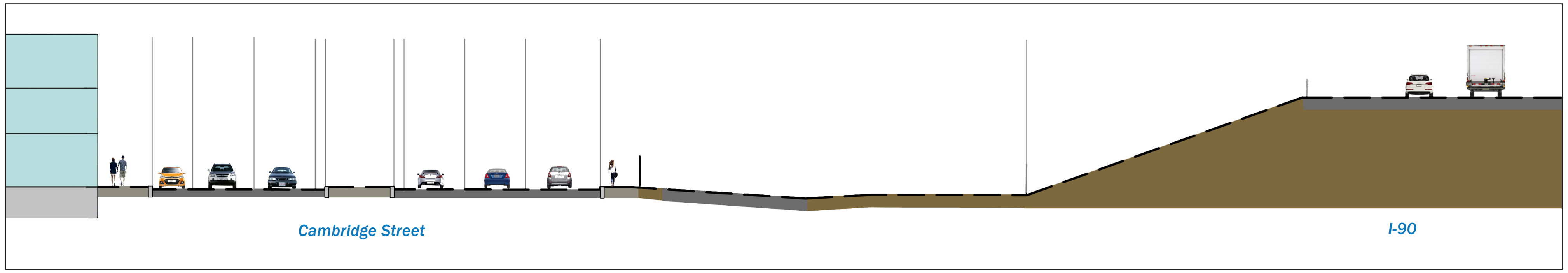


INSERT 5-1: Existing aerial of Soldiers Field Road, Charles River and Project Area

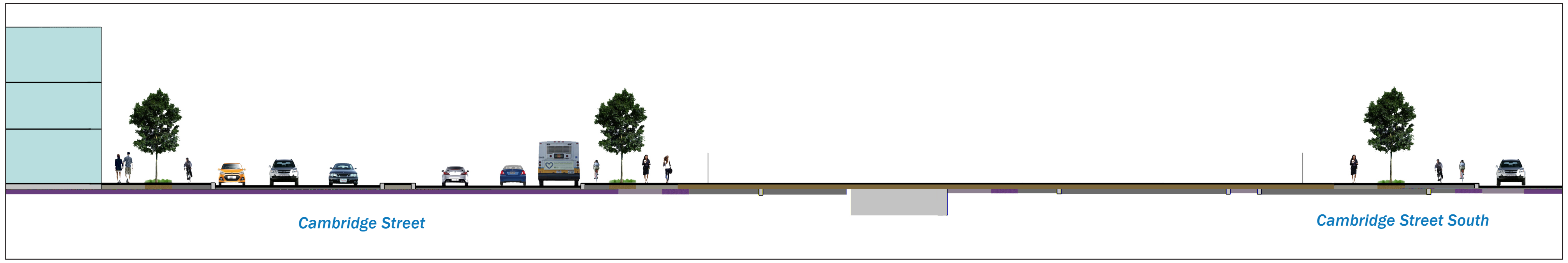


INSERT 5-2: Proposed view of Soldiers Field Road, the Charles River and the Project Area

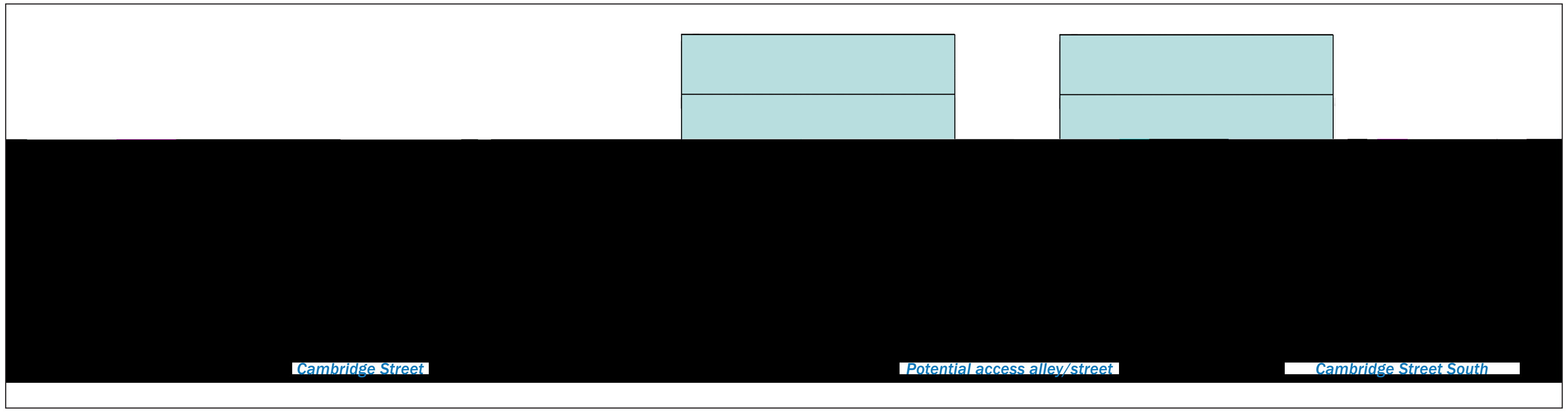
When SFR is relocated to the west, the resulting parkland along the Charles River reservation will provide a “visual gateway” to the Project Area for drivers approaching from both the north and the south, as well as for pedestrians and bicyclists on the PDW Path. Additionally, pedestrians, bicyclists and drivers headed east on Cambridge Street South will have dramatic views of the new parkland along the Charles River Reservation. See Inserts 5-1 and 5-2. This is covered in more detail in Section 5.4.


Cambridge Street
I-90

INSERT 6-1: Existing conditions section (B-B) through Cambridge Street and adjacent parcel.


Cambridge Street
Cambridge Street South

INSERT 6-2: Opening Year section (B-B) through Cambridge Street and adjacent parcel.

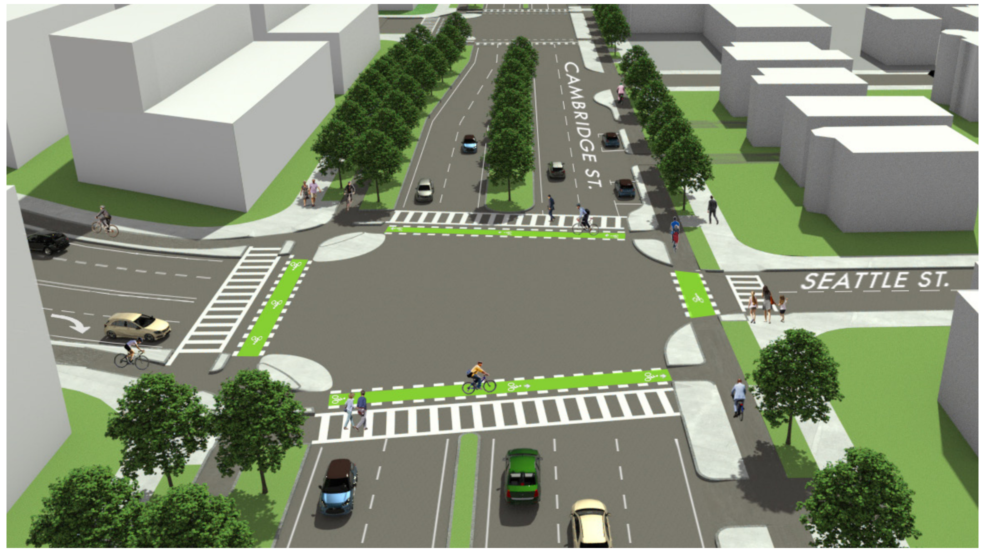

Cambridge Street
Potential access alley/street
Cambridge Street South

INSERT 6-3: 2040 Section (B-B) with Potential Development.

Today, from North Allston, the view across Cambridge Street to the east is dominated by earth berms supporting the I-90 Main Line and its interchange ramp system. See Inserts 6-1 through 6-3. Within the Project Area, a series of new streets will be developed and then supplemented with additional streets by Harvard for access to parcels as development proceeds. The principal east-west street will be Cambridge Street, which can eventually be transformed into an active, two-sided walkable street lined with commercial or residential uses. See Inserts 7-1 and 7-2.

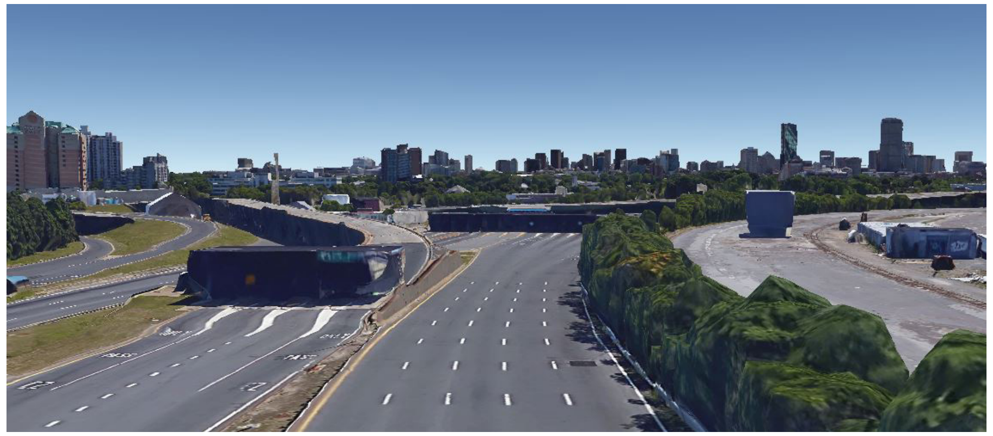
Untitled Map
Write a description for your map.
Legend

INSERT 7-1: Existing conditions view along Cambridge Street from Google Earth (looking West).

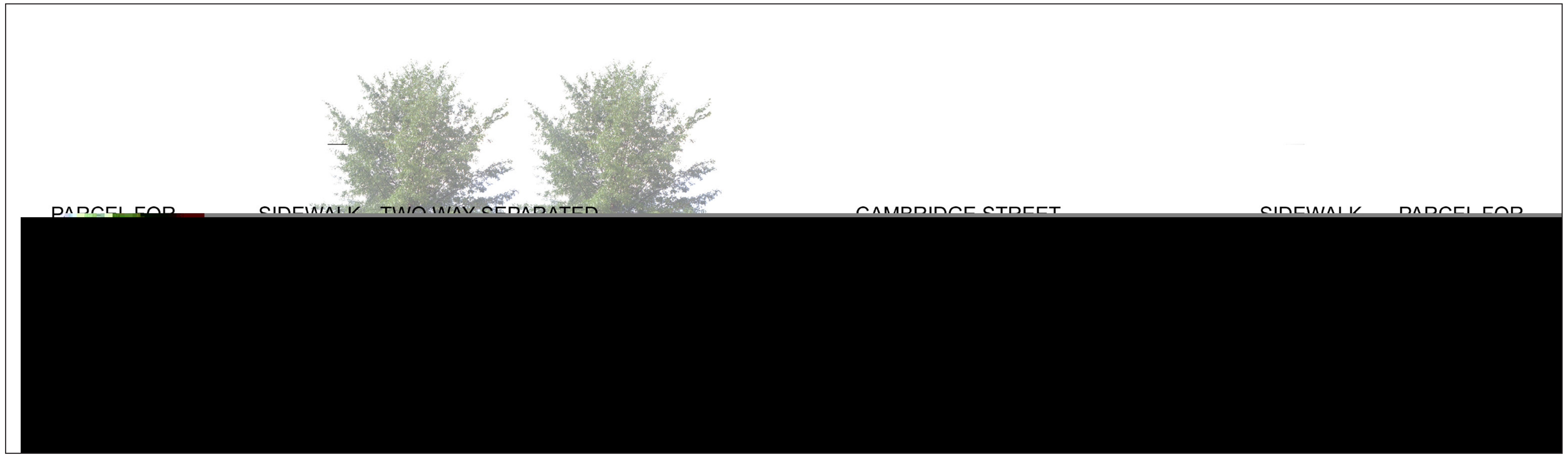

CAMBRIDGE ST.
SEATTLE ST.

INSERT 7-2: Conceptual Perspective of Cambridge Street at Seattle Street, Full Build with potential development (looking West).

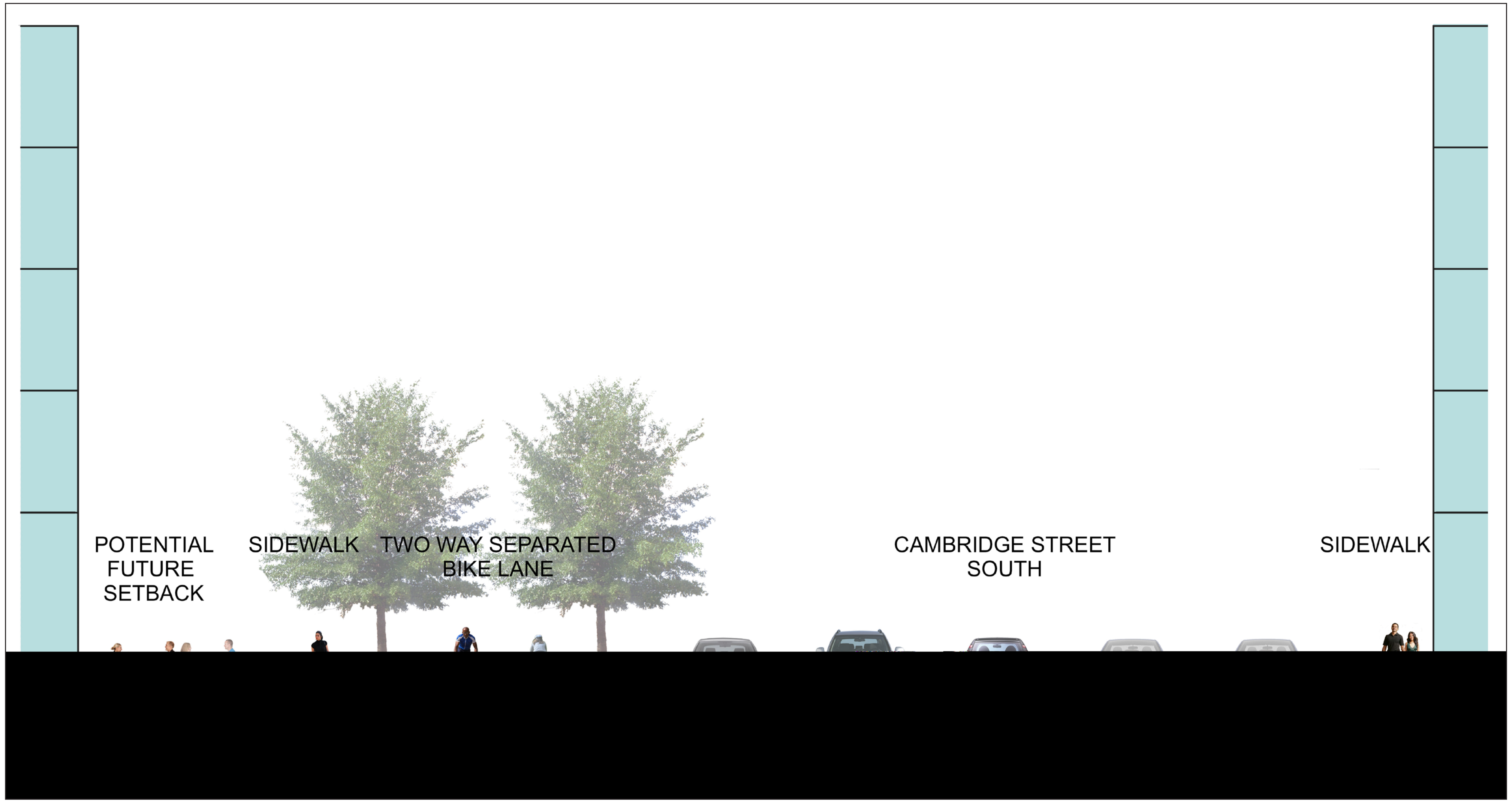
In the future, the Project Area will be returned to grade and this section of Cambridge Street South can become a two-sided walkable commercial or residential street. See Inserts 8-1 through 8-3.



INSERT 8-1: Image of existing condition facing the Charles River spanning Cambridge Street to Beacon Park Yard, including I-90 Main Line, toll plazas and on/off ramps


PARCEL FOR
SIDEWALK
TWO WAY SEPARATED
CAMBRIDGE STREET
SIDEWALK
PARCEL FOR

INSERT 8-2: Section B-B Cambridge Street South, Opening Year (Looking East)


POTENTIAL FUTURE SETBACK
SIDEWALK
TWO WAY SEPARATED BIKE LANE
CAMBRIDGE STREET SOUTH
SIDEWALK

INSERT 8-3: Section B-B Cambridge Street South, 2040 (Looking East)

5.3.3 Throat Area Variations

The narrowest section of parkland adjacent to the Project Area, the Throat Area, is where the major differences between the three variations are evident.

Graphics 5.3-2, 5.3-3 and 5.3-4 illustrate plan views of the 3K-HV, 3K-AMP and 3K-ABC Variations and provide locations of the cross sections at the narrowest location within the Throat Area and conceptual renderings shown on the following Chapter 5 graphics and figures.

① Cross Section View

- Graphic 5.4-5 3K-HV Throat Area Section
- Graphic 5.4-6 3K-AMP Throat Area Section
- Graphic 5.4-7 3K-ABC Throat Area Section
- Figure 5.4-2 4(f) Land Impacts - 3K-HV Section View
- Figure 5.4-5 4(f) Land Impacts - 3K-AMP Section View
- Figure 5.4-8 4(f) Land Impacts - 3K-ABC Section View
- Section 5.8.1.2: 3K-HV, 3K-AMP, 3K-ABC Cross Sections

② Rendering Views from the Throat Area

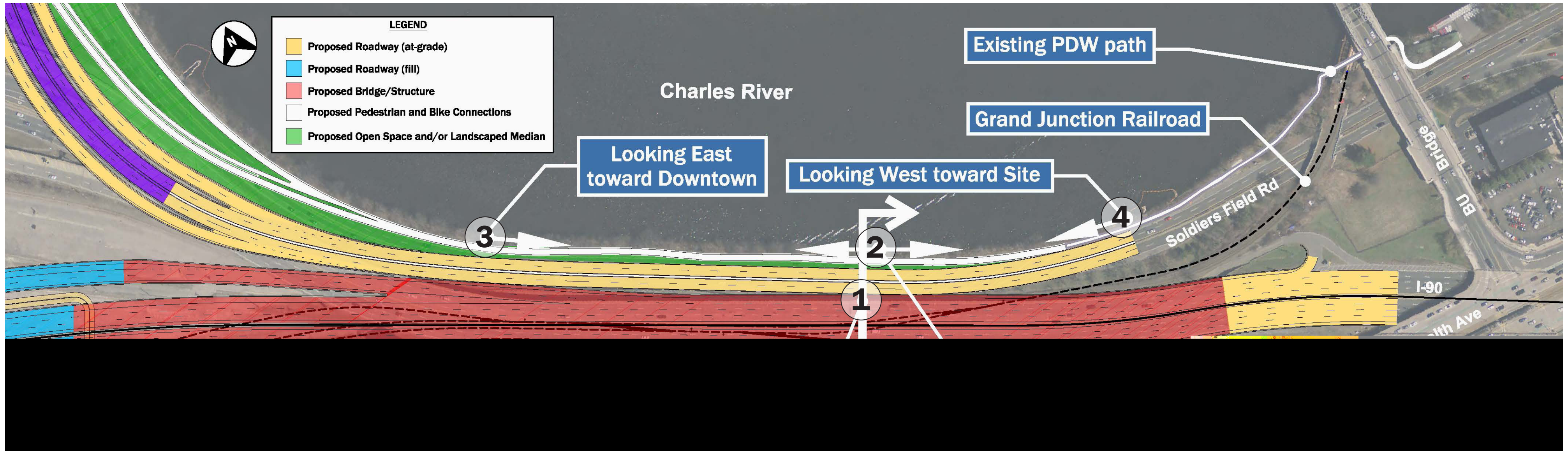
- Graphic 5.3-5 Conceptual rendering of 3K-HV Variation looking east towards downtown Boston from the Throat Area
- Graphic 5.3-6 Conceptual rendering of 3K-AMP Variation looking east towards downtown Boston from the Throat Area
- Graphic 5.3-7 Conceptual rendering of 3K-ABC Variation looking east towards downtown Boston from the Throat Area
- Graphic 5.3-8 Conceptual rendering of 3K-HV Variation looking west from the Throat Area
- Graphic 5.3-9 Conceptual rendering of 3K-AMP Variation looking west from the Throat Area
- Graphic 5.3-10 Conceptual rendering of 3K-ABC Variation looking west from the Throat Area

③ Rendering Views entering the Throat Area (looking east)

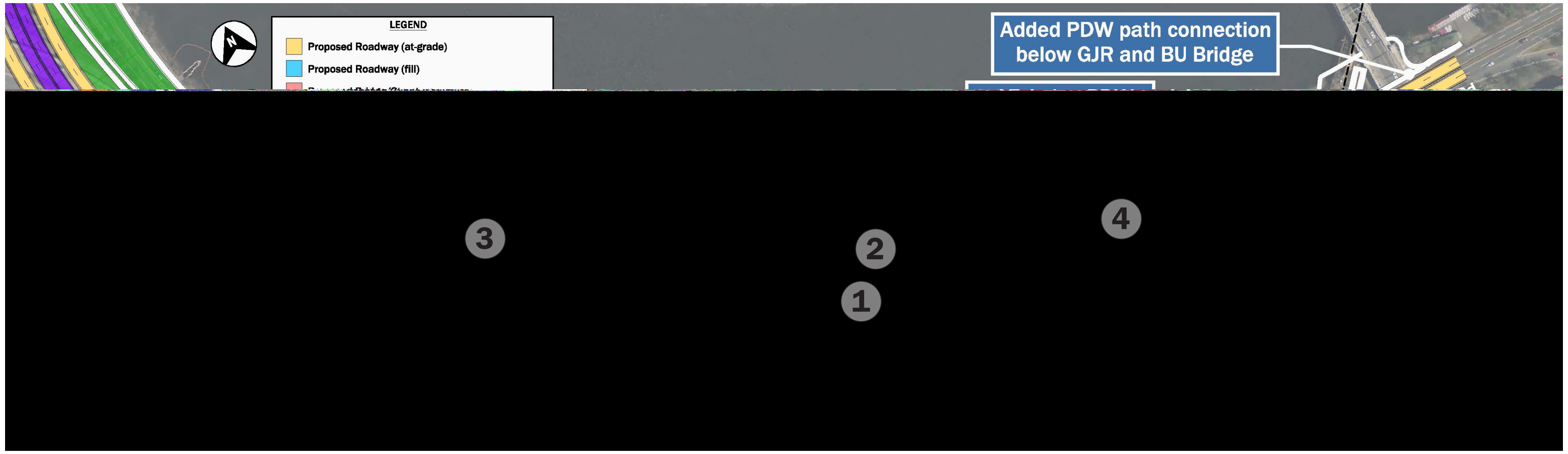
- Graphic 5.3-11 Conceptual rendering of 3K-HV Variation looking east towards downtown Boston entering the Throat Area
- Graphic 5.3-12 Conceptual rendering of 3K-AMP Variation looking east towards downtown Boston entering the Throat Area
- Graphic 5.3-13 Conceptual rendering of 3K-ABC Variation looking east towards downtown Boston entering the Throat Area

④ Rendering Views entering the Throat Area (looking west)

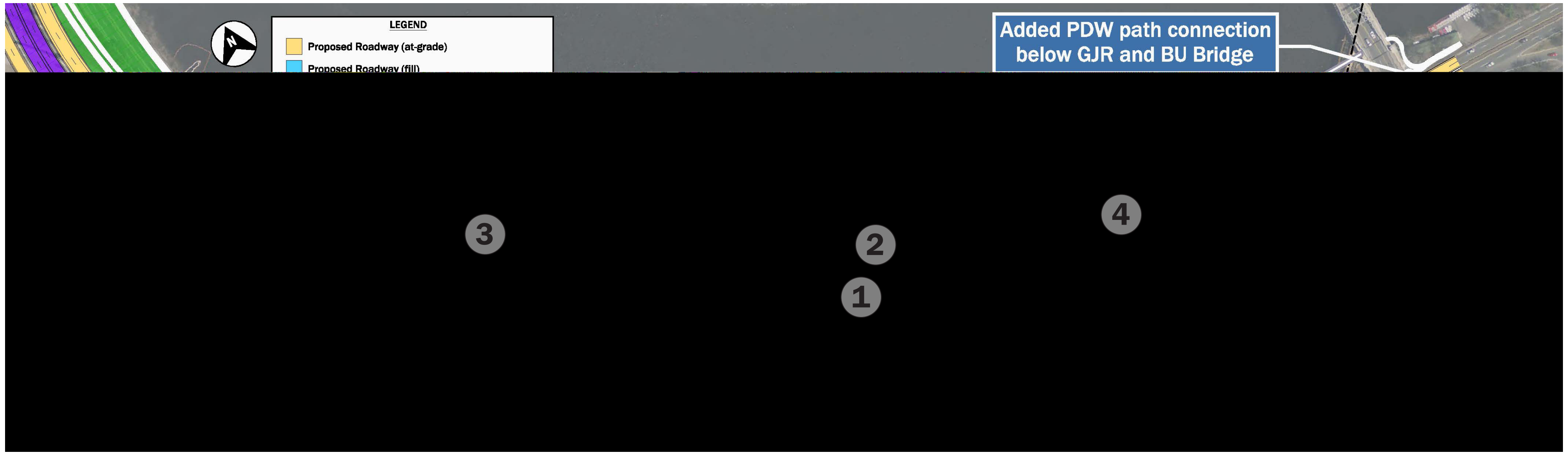
- Graphic 5.4-18 Conceptual rendering of 3K-HV Variation looking west entering the Throat Area
- Graphic 5.4-19 Conceptual rendering of 3K-AMP Variation looking west entering the Throat Area
- Graphic 5.4-20 Conceptual rendering of 3K-ABC Variation looking west entering the Throat Area


LEGEND
🟨 Proposed Roadway (at-grade)
🟦 Proposed Roadway (fill)
🟥 Proposed Bridge/Structure
⬜ Proposed Pedestrian and Bike Connections
🟩 Proposed Open Space and/or Landscaped Median
Charles River
Existing PDW path
Grand Junction Railroad
Looking East toward Downtown
Looking West toward Site
Soldiers Field Rd
BU Bridge
I-90
3
2
1
4

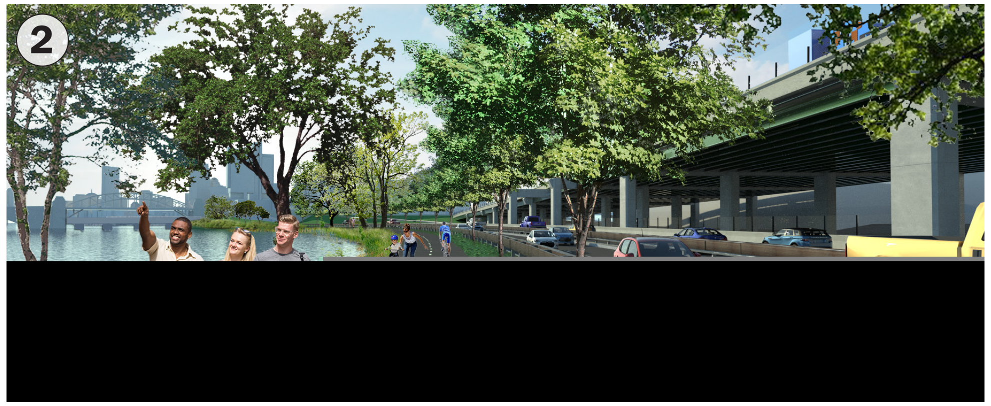
Graphic 5.3-2: 3K-HV Throat Area Variation with locations of throat area renderings and cross section


LEGEND
🟨 Proposed Roadway (at-grade)
🟦 Proposed Roadway (fill)
Added PDW path connection below GJR and BU Bridge
3
2
1
4

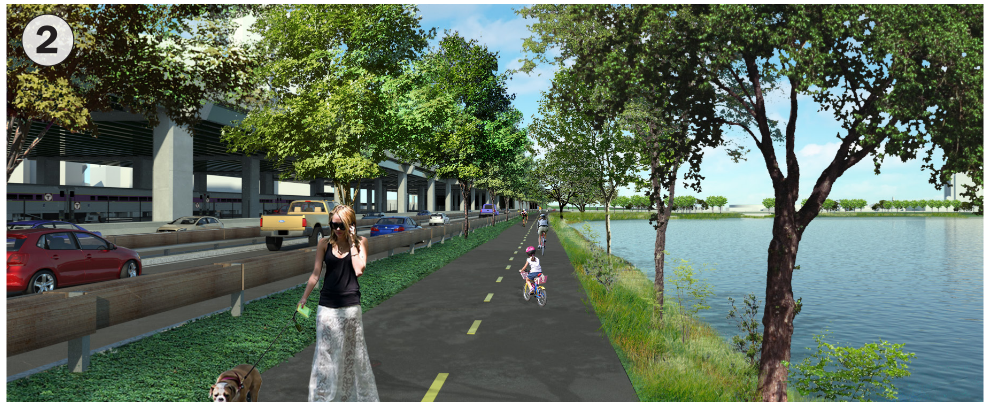
Graphic 5.3-3: 3K-AMP Throat Area Variation with locations of throat area renderings and cross section


LEGEND
🟨 Proposed Roadway (at-grade)
Added PDW path connection below GJR and BU Bridge
3
2
1
4

Graphic 5.3-4: 3K-HV Throat Area Variation with locations of throat area renderings and cross section



Graphic 5.3-5: Conceptual rendering of the 3K-HV Variation looking east towards downtown Boston from the Throat Area

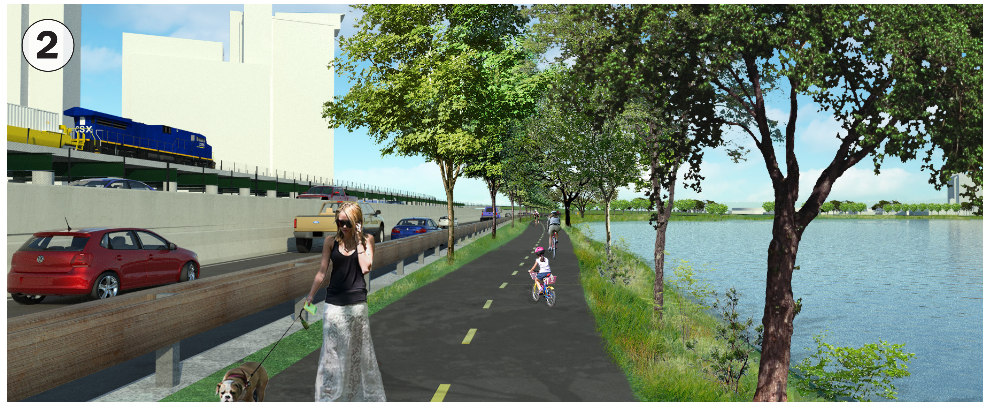


Graphic 5.3-8: Conceptual rendering of the 3K-HV Variation looking west from the Throat Area

3K-HV Variation

Within the Throat Area, the I-90 viaduct is higher and closer to the PDW Path than the 3K-AMP rail viaduct and 3K-ABC retained fill section. It will be a prominent feature in views to both the west and east along the path, but it will be visually buffered in growing seasons by tree plantings in a continuous landscaped buffer between the path and SFR. The path will be 12-foot-wide minimum for its entire length and will be in approximately the same location as the existing path, and the river bank will remain in its current condition. Shadow impacts on the PDW Path will increase slightly compared to existing conditions, however, shadows will only reach PDW Path in the winter, from mid-day through the evening.

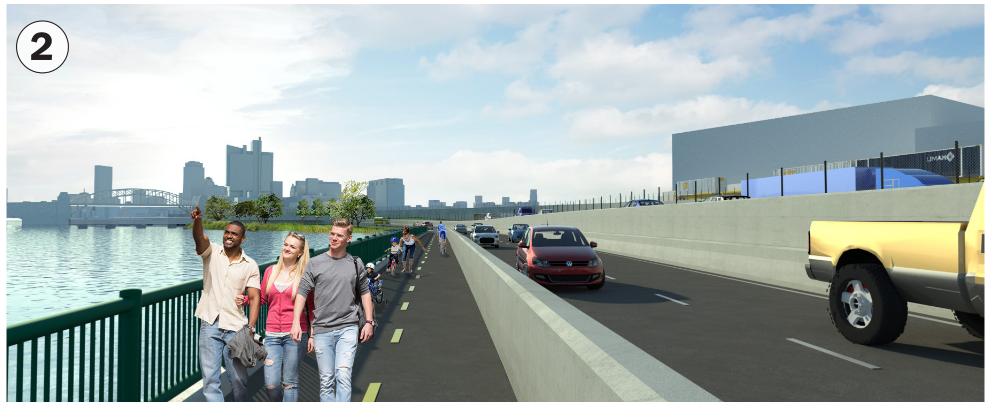
Graphic 5.3-6: Conceptual rendering of the 3K-AMP Variation looking east towards downtown Boston from the Throat Area



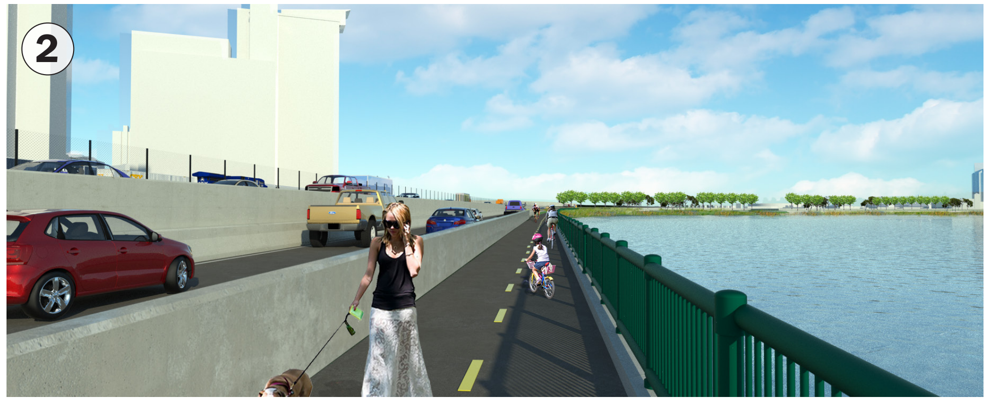
Graphic 5.3-9: Conceptual rendering of the 3K-AMP Variation looking west from the Throat Area

3K-AMP Variation

The rail viaduct will have less visual impact on PDW Path users than the 3K-HV Variation, as it will be lower in elevation and farther away from the river than the I-90 viaduct in 3K-HV. Additionally, the use of the viaduct by trains will be less frequent than the steady stream of traffic on the elevated I-90 viaduct. Partial separation between the PDW Path and SFR will allow for a landscaped buffer east and west of the narrowest section of the Throat Area. Westbound SFR will be at the same elevation as I-90, but the eastbound SFR lanes will be elevated on a retained fill section. The retaining wall will be 7 feet above westbound SFR and the PDW Path at its highest elevation, tapering back to match the eastbound SFR elevation to the east and west of that point. At its highest point, the retaining wall will partially screen eastbound SFR, I-90 and the rail viaduct, and it will be a prominent visual element for those using the PDW Path. The 12-foot-wide path will be in approximately the same location as the existing path, and the river bank will remain in its current state.



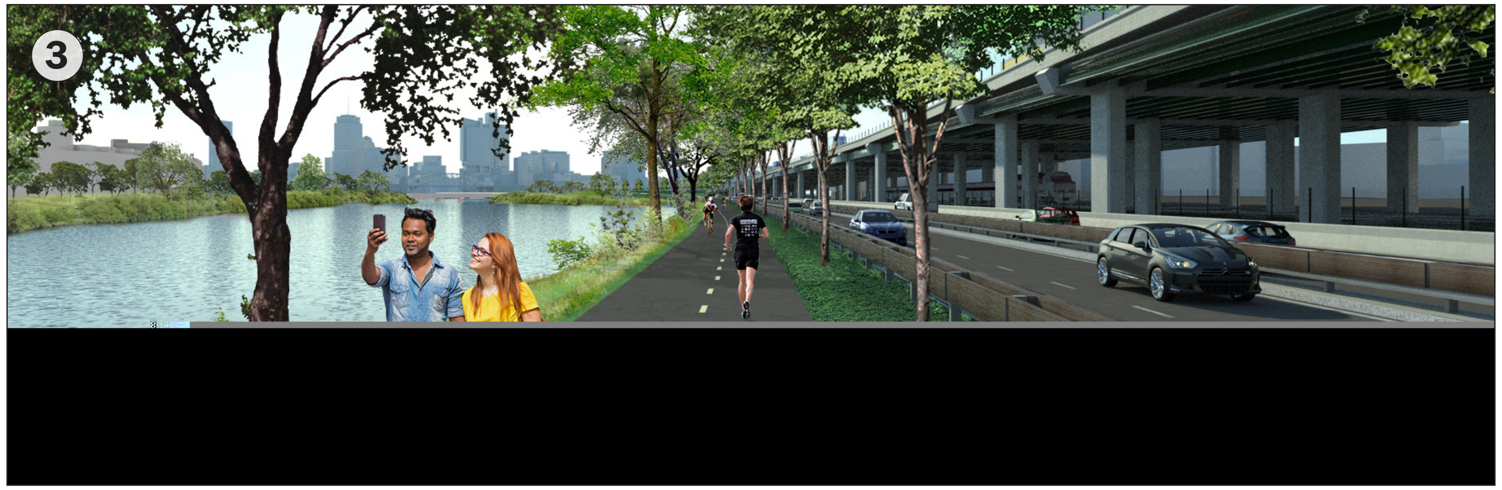
Graphic 5.3-7: Conceptual rendering of the 3K-ABC Variation looking east towards downtown Boston from the Throat Area



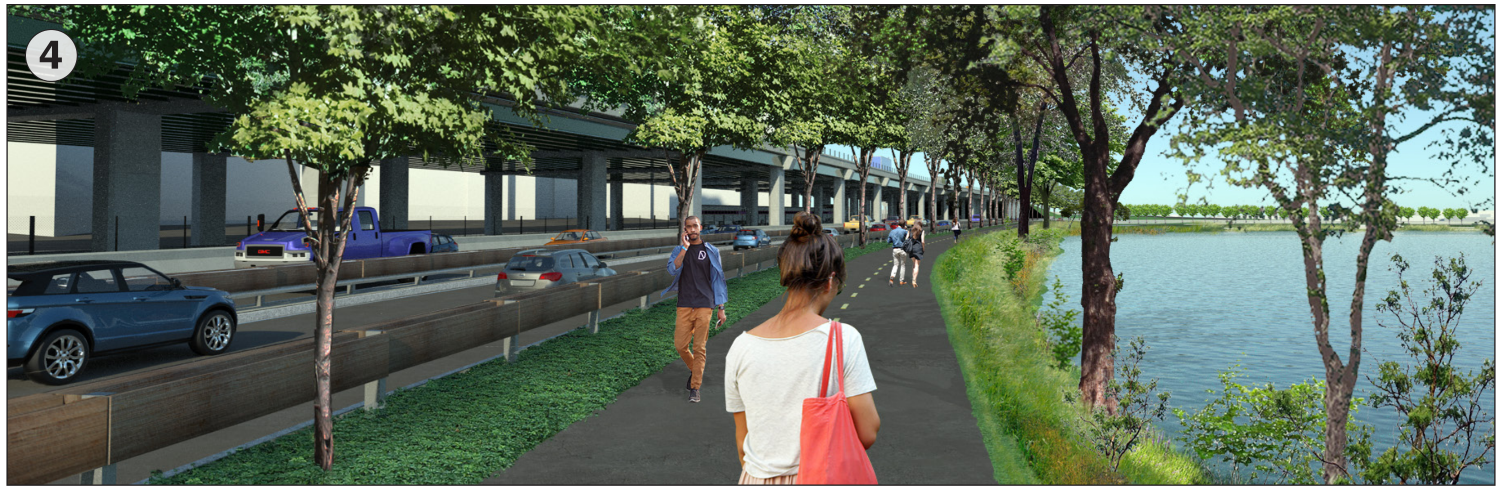
Graphic 5.3-10: Conceptual rendering of the 3K-ABC Variation looking west from the Throat Area

3K-ABC Variation

Under the 3K-ABC Variation, the elevated portion of the GJR will have even less visual impact on PDW Path users, as it will also be lower in elevation and farther away from the river than the I-90 viaduct in 3K-HV and the rail viaduct in 3K-AMP. This variation also places eastbound SFR above the westbound lanes and above I-90. The same 7-foot-high retaining wall will define the southern edge of eastbound SFR, and it will taper to the east and west as in the 3K-AMP Variation. The SFR retaining wall will partially screen eastbound SFR, I-90 and the rail viaduct, and it will be a prominent visual element for those using the PDW Path. The path will be 8.5-feet-wide at its narrowest for approximately 500 feet and will then widen to 12-feet-wide, and will be constrained for a distance of approximately 1,100 linear feet by the barrier on the south between PDW and SFR and by a railing on the north that will be mounted on a vertical retaining wall.

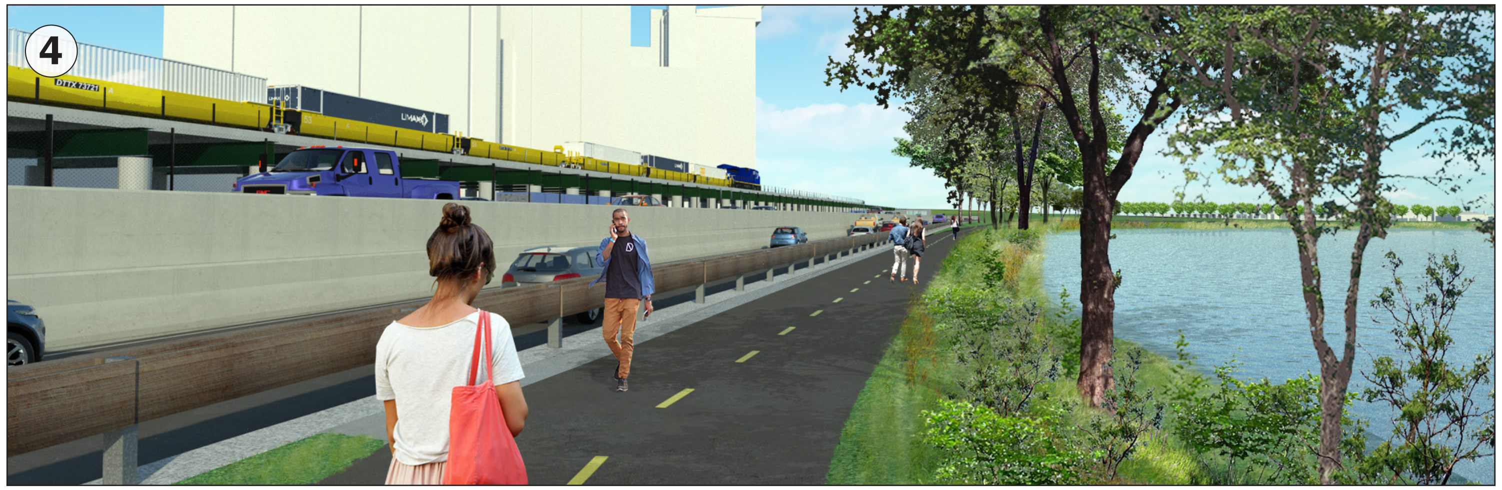


Graphic 5.3-11: Conceptual rendering of the 3K-HV Variation looking east towards downtown Boston entering the Throat Area

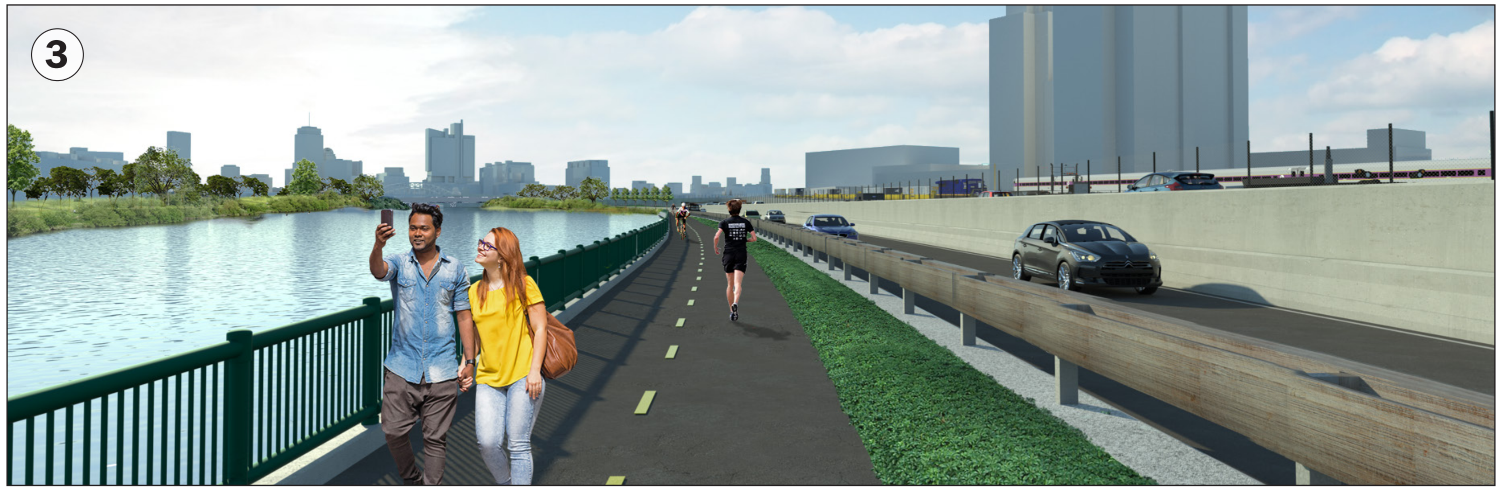


Graphic 5.3-14: Conceptual rendering of the 3K-HV Variation looking west entering the Throat Area

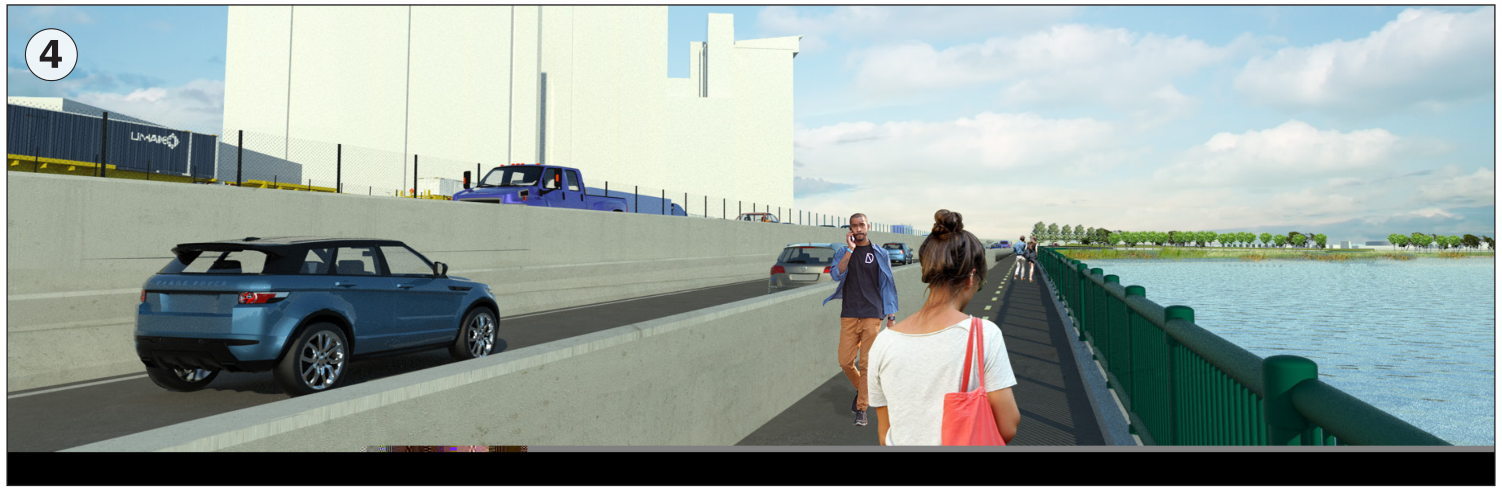
Graphic 5.3-12: Conceptual rendering of the 3K-AMP Variation looking east towards downtown Boston entering the Throat Area



Graphic 5.3-15: Conceptual rendering of the 3K-AMP Variation looking west entering the Throat Area



Graphic 5.3-13: Conceptual rendering of the 3K-ABC Variation looking east towards downtown Boston entering the Throat Area



Graphic 5.3-16: Conceptual rendering of the 3K-ABC Variation looking west entering the Throat Area

5.3.4 Rail Operations

In the 2025 Opening Year, the rail yard will be developed with four layover tracks for storage of up to eight train sets, paved vehicular access areas, employee parking, an electrical substation and crew quarters. The function and operation of these improvements are discussed in Section 5.9. The proposed development will be consistent with existing rail uses and will not substantially change the visual character of the site. As the intended use for the rail yard will be for mid-day layover, MassDOT will only construct limited lighting necessary for safety. The 2025 Opening Year rail yard will not have an effect on the overall visual and aesthetic character of the Project Area.

In the 2040 Design Year, the rail yard will retain the same features as the 2025 Opening Year. The rail yard will provide layover space for eight train sets in the 2040 Design Year to allow room for the development of the station and platforms.

In both the 2025 Opening Year and the 2040 Design Year, the I-90 Urban Interchange Preferred Alternative will not substantially change the visual character of the Worcester Main Line ROW compared to existing conditions. The proposed track and signal modifications will not have an effect on the visual and aesthetic nature of the Worcester Main Line.

5.3.5 West Station

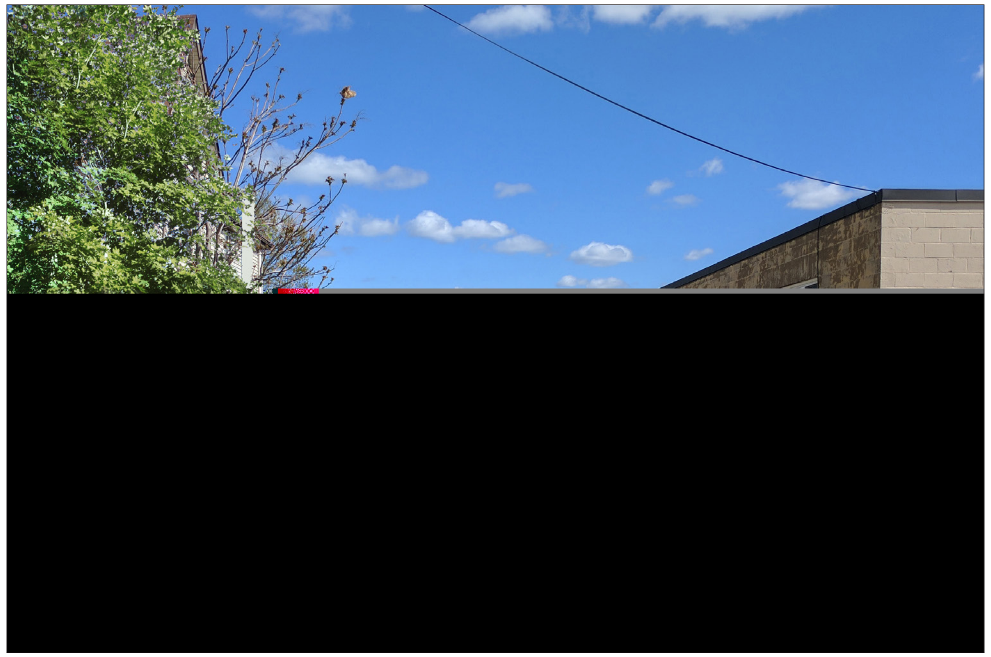
The proposed commuter rail station will not be constructed until the 2040 Design Year when proposed development is intended to provide the required demand. When complete, it will reflect a visual character consistent with other stations on the Worcester Main Line (for example, the recently completed Boston Landing Station). In the meantime, a pedestrian and bicycle bridge will be constructed over the Worcester Main Line, the rail yard and I-90. The bridge will connect Malvern Street to a roadway constructed for the new interchange layout. The functional characteristics of the access way are discussed in further detail in Section 5.7. The Malvern Street bridge will be visible from the Cambridge Street Bridge to the west and the Commonwealth Avenue Bridge to the east as it spans the railroad and rail yard. The bridge will be constructed in a manner consistent with other pedestrian and bicycle bridge crossings over the Worcester Main Line. Moreover, the access way will not cause any obstruction of existing viewsheds or view corridors. See Inserts 9-1 and 9-2. The proposed Malvern Street bridge will not have an adverse effect on the visual and aesthetic environment in the 2025 Opening Year.

In the 2040 Design Year, West Station will not change the visual massing present on the existing rail yard. The station platforms alone will not substantially change the visual character of the site, as they will be limited in height and visually consistent with other elements existing in the rail yard.

Some elements of the station, including the Malvern Street and Babcock Street pedestrian and bicycle bridge (See Inserts 9-1, 9-2, 10-1 and 10-2), elevated bus loop, bus loop support structures, and stairways and elevators connecting the platforms and bus loop, will be visible from streets adjacent to the Project Area to the south, from the Cambridge Street and Commonwealth Avenue Bridges, and from the proposed Malvern Street bridge.

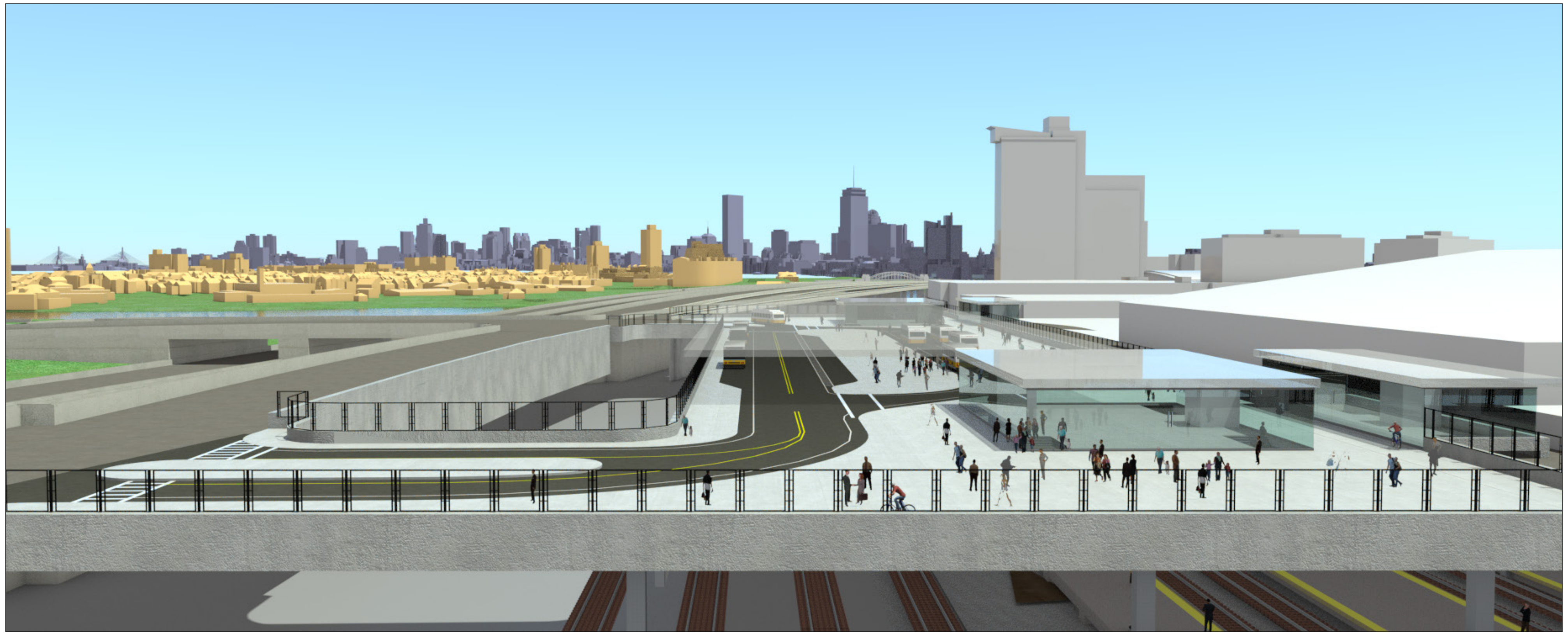
INSERT 9-1: Existing views north from Malvern Street

INSERT 10-1: Existing views north from Babcock Street



INSERT 9-2: Proposed views north from Malvern to West Station with new pedestrian/bike access

INSERT 10-2: Proposed views north from Babcock to West Station with new pedestrian/bike structure



INSERT 11-1: Schematic view of West Station looking East towards the Boston Skyline

As shown on Insert 11-1, the elevation and orientation of West Station provides several opportunities for creating user-oriented spaces. Should the siting of new development on the air rights parcels allow, there would be dramatic views of the Charles River and surrounding neighborhoods, and possibly of the downtown Boston skyline. The open spaces in and around the station will serve as an elevated pedestrian plaza offering expansive views in several directions.

West Station will have a positive effect by providing neighborhood placemaking and reinforcing the presence of a multi-modal train station. West Station will be constructed in a manner visually consistent with other stations along the MBTA Worcester/Framingham line.

The station will include lighting for the station track, within the station, and along the bus loop. Lighting will be designed to prioritize the safety of station users, including those arriving to the station by vehicle, bicycle or on foot. It will also be designed to minimize light pollution. Light pollution[1] at commuter rail stations originates mainly from the illumination of platform areas, parking lots and security flood lights, as well as from street lighting.

West Station will be located in a heavily developed area and surrounded by extensive existing transportation infrastructure, including I-90. Lighting at West Station will be oriented toward vehicle, bicycle and pedestrian safety, and will not have an adverse effect on the visual character of the Project Area.

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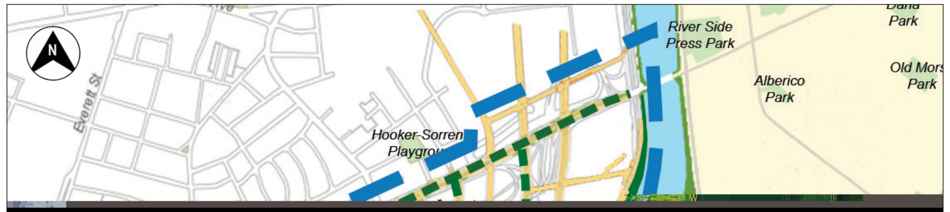
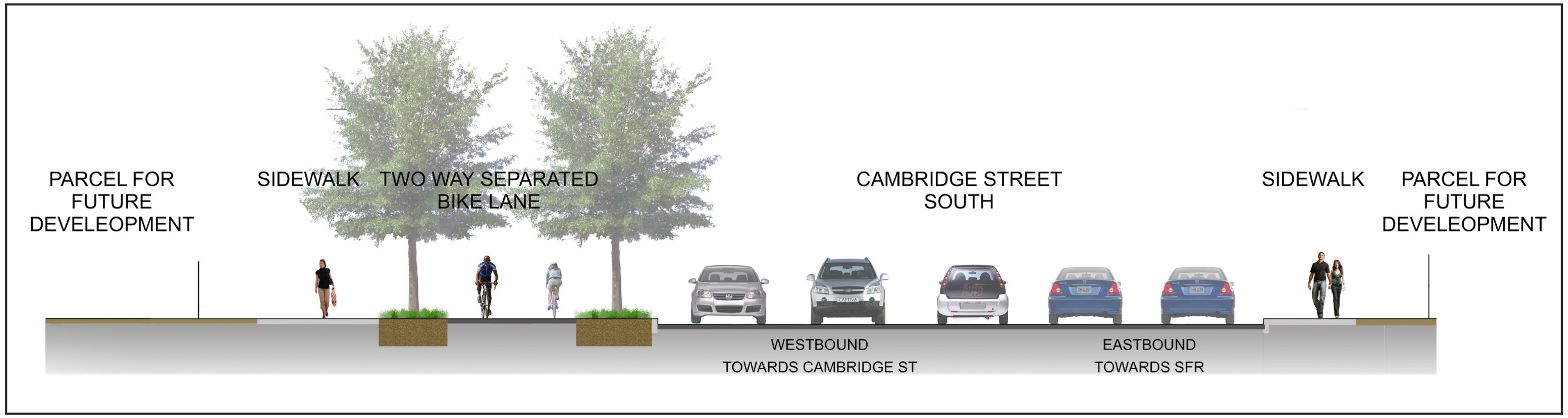
[1] Outdoor lighting has the potential to impair the visibility of stars as a result of light pollution, which is primarily caused by stray upward illumination from poorly designed outdoor lighting. Upward-beamed light reflects off dust particles and fine water droplets in the atmosphere to cause a “sky glow” that can be brighter than the stars.



Graphic 5.4-1: Project Area Open Space: expanded riverfront park and improved bike connections - both north-south and east-west



Graphic 5.4-2: Section through Cambridge Street South

5.4 Open Space and Recreation

5.4.1 No Build

The City of Boston's Open Space and Recreation Plan cites the barrier created by I-90 and SFR to existing open space, primarily to the Charles River Reservation, but also between neighborhoods to the north and to the south of I-90. Under the No Build, this situation will continue to be a barrier.

5.4.2 I-90 Urban Interchange Preferred Alternative

The I-90 Urban Interchange Preferred Alternative will allow for north/south connections through the Project Area for pedestrians and bicyclists. It will provide connections from North Allston and neighborhoods to the north with neighborhoods and open space to the south. See Graphic 5.4-1.

The Project will include sidewalks and separated bike lanes on both the Seattle Street Connector, connecting to Malvern Street, and on the Cattle Drive Connector, connecting to Babcock Street. Both connections will pass through West Station. The lanes will be protected to provide safe travel. Street trees will be added to help buffer the roadway. However, the lanes will be more suitable for riders with some city road experience, as the roads will be heavily used and require the crossing of significant intersections.

The design of the Seattle Street Connector and the Cattle Drive Connector, (and the pedestrian/bicyclist connections from Malvern Street and Babcock Street), vary in slope between the three Throat Area Variations. Table 5.4-1 describes the slope variations between the major connector streets, Seattle, Cattle and Babcock, and West Station. For Malvern Street to West Station, all three Throat Area Variations are the same with a difference in height of approximately 7 feet to the West Station structure. This variation will have impacts on how easily one can travel between north and south neighborhoods and open space.

The treatment of the parcel edges will also impact the experience of sidewalk/bike lane users, particularly along the connectors and Cambridge Street South, which are all a significant distance from any residential or commercial abutter. The design of fencing and planted edges will be more hospitable to pedestrians and bicyclists to encourage use and also to create a better interim condition until the property is developed by Harvard.

Design of the entire proposed street grid embraces the Complete Streets approach. Cambridge Street and Cambridge Street South will be designed as Boston Complete Streets; (i.e., recommended to be multi-modal, green and smart). The design will include sidewalk-level separated bike lanes, sidewalks and street tree plantings to help buffer sidewalk and bike lane users from vehicular traffic. See Graphic 5.4-2. There will be many intersections on both streets, and they will be designed to allow for safe crossing of all travel modes. As previously noted, Cambridge Street is identified in Boston's Complete Streets guidelines as a Neighborhood Connector, connecting neighborhoods in Allston, Brookline and Cambridge, and will be designed accordingly.

Cambridge Street South will be a new connector. It will serve as the primary pedestrian and bicyclist connection from neighborhoods to the north and south of I-90 to the Charles River Reservation. Two-way separated bike lanes, sidewalk and two rows of tree plantings will define the north side of Cambridge Street South as a greenway to the Charles River Reservation. This bicycle/pedestrian way will be designed to integrate with future development plans and an open space system that allows for public access to, and through, the future development.

The I-90 Urban Interchange Preferred Alternative addresses the vision and concerns voiced by advocates of the so called "People's Pike" by providing a direct bicycle and pedestrian connection from Allston to the PDW Path, with separated facilities for bicycles and pedestrians. The direct route along Cambridge Street South provides the opportunity for a connecting corridor with landscaping and street amenities. It provides access not only to the path, but also to the improved parkland along the Charles River. This location is superior in comparison to one further south adjacent to the I-90 corridor, which due to space and engineering constraints, must be more utilitarian and will be less attractive due to its closer proximity to high-speed automobile traffic, train operations, and potential future air rights development in the West Station area. Nonetheless, the urban interchange provides bicycle and pedestrian connections to the West Station area and beyond to Commonwealth Avenue, while providing the desired direct route to the PDW Path and the Charles River Reservation.

Table 5.4-1: Slopes Variations Between Major Connector Streets

	Slope Variation		
Throat Area Variation/ Connector	**Difference in height (in feet)**	**Slope Distance (in feet)**	**Average Slope (%)**
Seattle Street Connector: Slope Between Cambridge Street South and High Point Near West Station			
3K-HV	31.4	970	3.2
3K-AMP	33.5	1,425	2.4
3K-ABC	30.8	1,150	2.7
Cattle Drive Connector: Slope Between Cambridge Street South and High Point Near West Station			
3K-HV	34.5	1,200	2.9
3K-AMP	34.8	1,790	1.9
3K-ABC	32.0	1,150	2.8
Babcock Street Connector: Slope Between Cambridge Street South and High Point Near West Station			
3K-HV	25.9	1,090	2.4
3K-AMP	22.4	1,140	2.0
3K-ABC	23.4	1,470	1.6

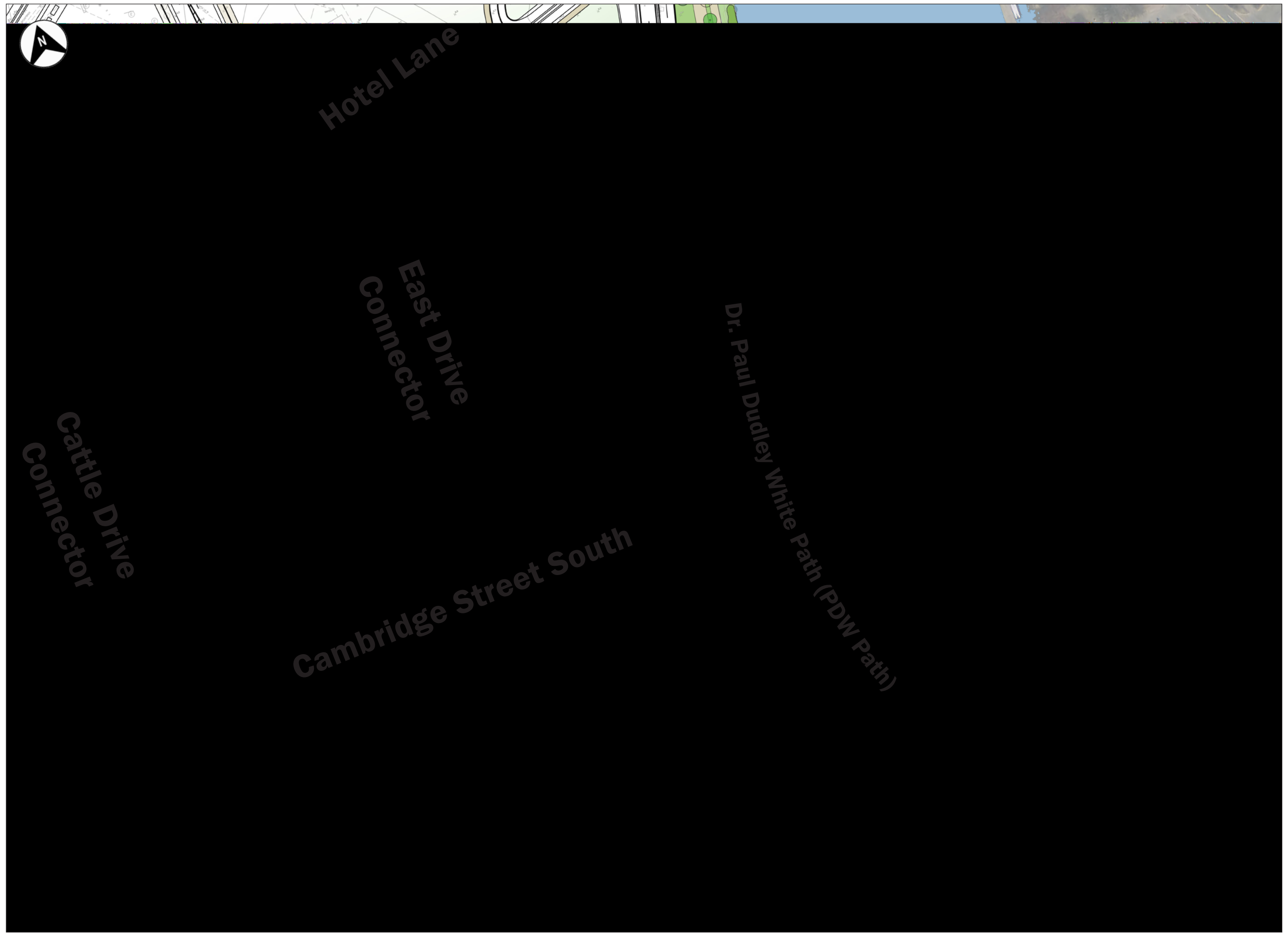
A significant Project open space opportunity will be the expansion of the parklands along the Charles River adjacent to the Project site, and improved access from the surrounding neighborhoods along the north side of Cambridge Street South. At its widest point, the parkland will expand from 14 feet to 155 feet in width, which is similar in scale to the Esplanade Play Space along the river. See Graphic 5.4-3. In addition, the expanded parkland will allow for new separated bicycle and pedestrian paths along the river.

The tree-lined bicycle and pedestrian way along the north side of Cambridge Street South will connect at grade with the park, as SFR passes under, greatly improving neighborhood access to the expanded parklands and to the improved PDW Path.

The park will be large enough for a variety of neighborhood-scale events and activities and will be a destination along the PDW Path. The conversion of the vehicular ramp to Cambridge Street to bicycle and pedestrian paths will make it easier to navigate a difficult section of the bike path called the Narrows. See Graphic 5.4-4. It will create a safer and stronger connection to River Street and Magazine Beach, and to new walking and bicycling facilities along Cambridge Street.

5.4.3 Rail Operations/West Station

There will be no direct impacts to open space and recreation from rail operations and West Station.



Graphic 5.4-3: Conceptual PDW Path with Open Space at Cambridge Street South

Graphic 5.4-4: Conceptual rendering of separated pedestrian and bike paths approaching River Street

5.4.4 Throat Area Variations

Graphics 5.4-5, 5.4-6 and 5.4-7 illustrate the design perspectives. They are intended to provide an overall cross sectional view in this constrained area to help convey the experience for all PDW Path users.

Given space constraints in the Throat Area, none of the variations have adequate width for separated bicycle/pedestrian paths. In all three variations, park users will be at grade with fast-moving traffic on SFR nearby, similar to today's condition. The 3K-HV Variation will provide the most separation from oncoming traffic and a greater sense of separation and safety. Both the 3K-AMP and 3K-ABC Variations provide less separation from oncoming traffic.

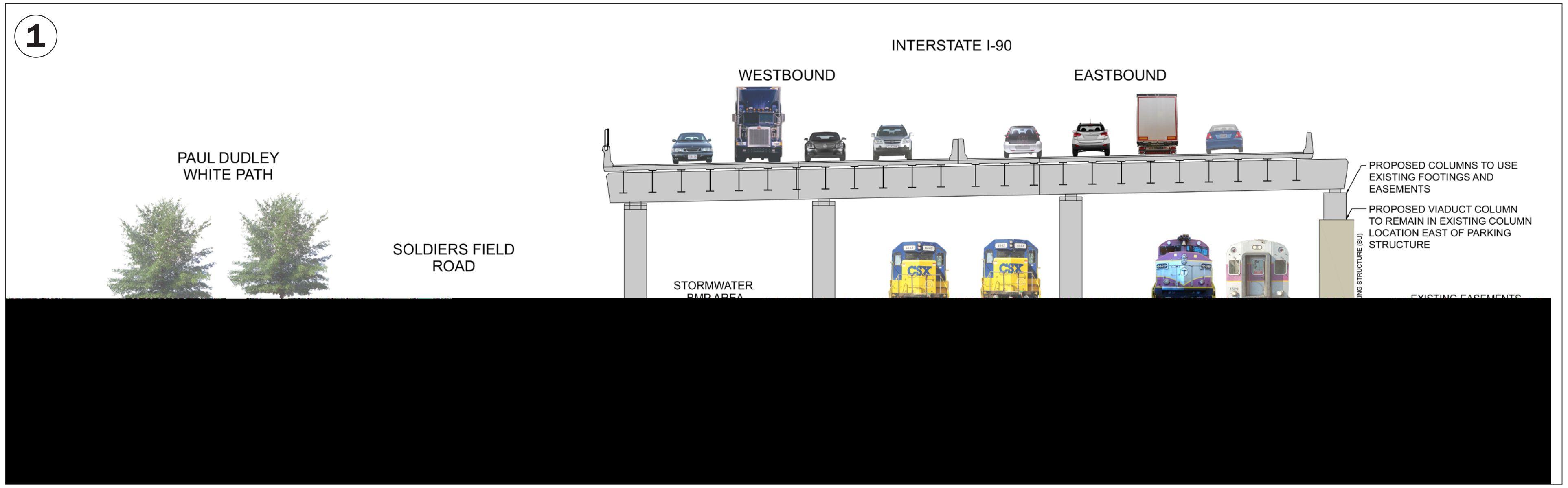
The following provides a comparison of parkland opportunities for each of the Throat Area Variations.

3K-HV Variation: The PDW Path will be 12 feet wide, and a sense of separation between the path and moving traffic on westbound SFR will be created by a linear landscaped swath extending westward from the easternmost pinch point in the throat to a maximum width of 12 feet. This linear parcel, landscaped with trees, will provide shade for users of the PDW Path and will partially screen the view of the approximately 35-foot-high I-90 viaduct which is 55 feet to 65 feet south of the PDW Path. Shadow impacts on the PDW Path will increase slightly compared to existing conditions, however, shadows will only reach PDW Path in the winter, from mid-day through the evening.

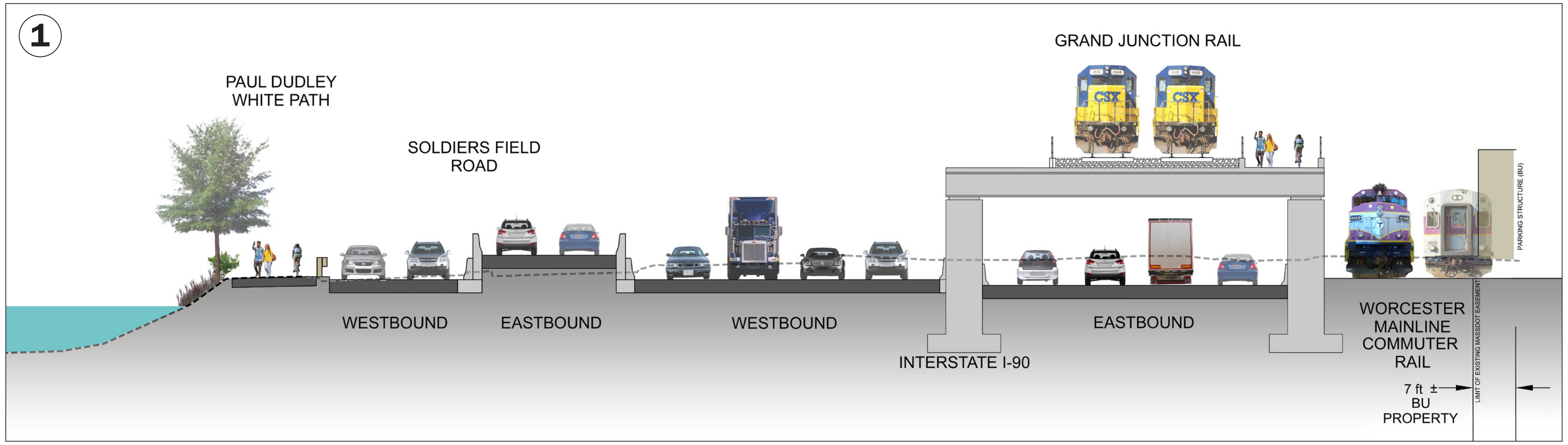
The Charles River embankment adjacent to the PDW Path will remain in its current state. In sum, those using the PDW Path will have views of landscaping on both sides of the PDW Path and will be physically and visually buffered from the two-way traffic on SFR.

3K-AMP Variation: This variation will also have a continuous 12-foot-wide PDW Path, but the offset between the path and SFR varies throughout the Throat Area. Within the approximately 200-foot narrowest section of the Throat Area, the PDW Path will be separated from the two SFR westbound lanes by only a 2-foot-wide guardrail. To the east and west of the narrowest section, of that point, this separation will vary from a width of 0 feet to 12 feet, allowing for landscaping similar to that described above in Variation 3K–HV. The two eastbound lanes of SFR will be elevated above the westbound lanes in this variation and separated from the westbound lanes by a retaining wall. This wall will be approximately 7 feet high (including height of barrier) at the narrowest point in the Throat Area and will taper in height to the east and the west. The wall will be a prominent visual element in the viewshed of those on the path, but it will also partially obscure their views of traffic on eastbound SFR, I-90 and of the rail viaduct. The rail viaduct is approximately 18 feet high and varies in distance between 105 feet to 120 feet from the PDW Path. As in the 3K-HV Variation, the Charles River embankment will remain in its current state.

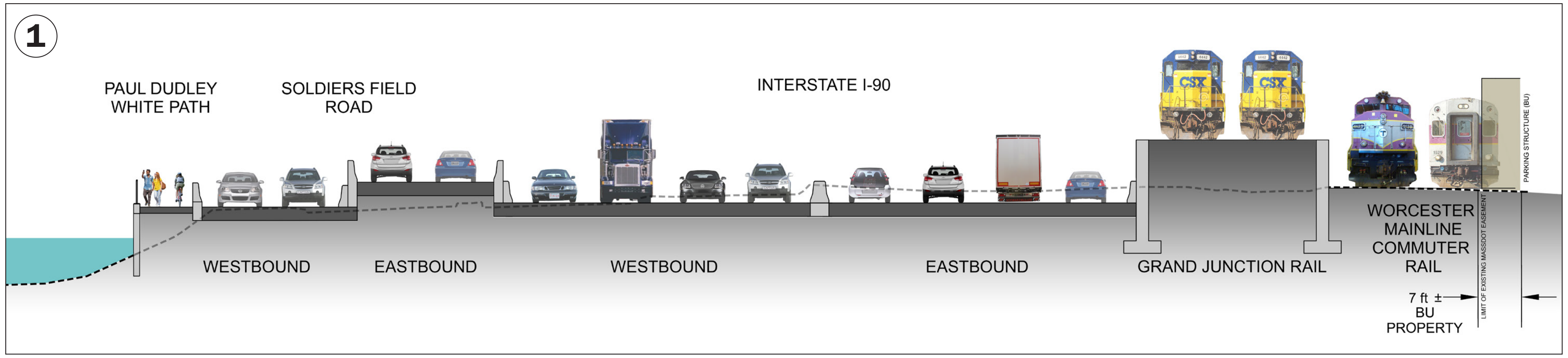
3K-ABC Variation: This variation will feature the same vertical separation between the SFR eastbound and westbound lanes and, as in the 3K-AMP Variation, the retaining wall will partially block views of eastbound SFR, I-90 and the GJR bridge over I-90 from the PDW Path. The GJR will be elevated on retained fill in this alternative up to 18 feet high and will be approximately 150 feet south of the PDW Path. The PDW Path will be 8.5 feet wide in the ABC Variation for approximately 500 feet within the narrowest section of the Throat Area, with no offset from the concrete barrier separating it from westbound traffic on SFR. The PDW Path will increase to 12 feet wide east and west of the narrowest section of the Throat Area. On the north side of the PDW Path, there will be a railing mounted on a retaining wall. The narrower path, constrained on both sides by the concrete barrier and the protective railing, combined with the proximity to westbound traffic on SFR, will create a very different visual experience from the other two variations. The Charles River embankment will be impacted by the installation of the retaining wall supporting PDW Path.


1
INTERSTATE I-90
WESTBOUND
EASTBOUND
PAUL DUDLEY WHITE PATH
SOLDIERS FIELD ROAD
STORMWATER
PROPOSED COLUMNS TO USE EXISTING FOOTINGS AND EASEMENTS
PROPOSED VIADUCT COLUMN TO REMAIN IN EXISTING COLUMN LOCATION EAST OF PARKING STRUCTURE

Graphic 5.4-5: 3K-HV Throat Area Section, Looking East. (Location of narrowest section of Throat Area)


1
GRAND JUNCTION RAIL
PAUL DUDLEY WHITE PATH
SOLDIERS FIELD ROAD
WESTBOUND
EASTBOUND
WESTBOUND
EASTBOUND
INTERSTATE I-90
WORCESTER MAINLINE COMMUTER RAIL
PARKING STRUCTURE (BU)
LIMIT OF EXISTING MASSDOT EASEMENT
7 ft ±
BU PROPERTY

Graphic 5.4-6: 3K-AMP Throat Area Section, Looking East. (Location of narrowest section of Throat Area)


1
PAUL DUDLEY WHITE PATH
SOLDIERS FIELD ROAD
INTERSTATE I-90
WESTBOUND
EASTBOUND
WESTBOUND
EASTBOUND
GRAND JUNCTION RAIL
WORCESTER MAINLINE COMMUTER RAIL
PARKING STRUCTURE (BU)
LIMIT OF EXISTING MASSDOT EASEMENT
7 ft ±
BU PROPERTY

Graphic 5.4-7: 3K-ABC Throat Area Section, Looking East. (Location of narrowest section of Throat Area)

Shadow Study

A shadow study was prepared for each of the three Throat Area Variations at three times of the day (9 a.m., 12 p.m. and 3 p.m.) on four days of the year: June 21, December 21, March 21 and September 21. In the 3K-HV Variation, the PDW Path is in partial to full shadow during the winter solstice from mid-day through the evening. No shadows are cast on the PDW Path by Variations 3K-AMP or 3K-ABC. The full shadow study is provided in Appendix K.

5.4.5 Section 4(f)

Although evaluation of Section 4(f) impacts is considered at the federal level, each of the Throat Area Variations being considered as part of the Project would have various levels of anticipated use of Section 4(f) properties, and therefore a summary of anticipated 4(f) impacts is included in this MEPA documentation to further the comparative analysis process. Additionally, the MEPA certificate for the ENF requires that 4(f) be considered as part of the DEIR for the Project. This section provides a summary of anticipated impacts associated with the proposed design variations.

Figure 4.4-1 identifies public parkland and historic properties that qualify for protection under Section 4(f) within one-quarter mile of the Project Area. A full Section 4(f) Evaluation will be issued by FHWA as part of the NEPA process, and will include a finding on the use of both the historic and the public parkland resources within the Project Area.

Regulatory Framework

Section 4(f) of the Transportation Act of 1966 (Section 4(f)) was enacted to ensure that the U.S. Secretary of Transportation develops “transportation plans and programs that include measures to maintain or enhance the natural beauty of lands crossed by transportation activities or facilities.” Under Section 4(f) now codified at 23 U.S.C. § 138 and 49 U.S.C. § 303, “publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, refuge, or site)” are considered protected resources requiring special consideration.

State Departments of Transportation (DOTs) are required through the Section 4(f) process to avoid and minimize the use of 4(f) properties. For Historic properties, project impacts that require either a property acquisition from, or that are determined in the Section 106 process to have an adverse effect upon, an NR-listed or NR-eligible property will require review under Section 4(f). FHWA regulation 23 CFR 774 describes the methods used to implement Section 4(f) requirements including potential constructive use determinations. Unlike some other environmental categories that assess impacts, Section 4(f) specifically looks at use of a property, and if a use is determined to occur, the potential impacts of that use. The use of a Section 4(f) property may be:

1. Direct - through direct alteration of the feature;
2. Indirect or “constructive” - such as a visual or noise impact that impairs the functional use or quality of the 4(f) properties; and/or
3. Temporary - the function or quality of the property would only be impacted temporarily such as during construction, then return to its original state at later time.

Federal Highway Administration (FHWA) Guidance indicates that “before approving a project that uses Section 4(f) property, FHWA must either determine that the impacts are de minimis, or undertake a Section 4(f) Evaluation. A de minimis impact is one that, after considering avoidance, minimization, mitigation, and enhancement measures, results in no adverse effect to the activities, features, or attributes qualifying a park, recreation area, or refuge for protection under Section 4(f). For historic properties, a de minimis impact is one that results in a Section 106 determination of “no adverse effect” or “no historic properties affected.” A Section 106 No Adverse Effect finding only requires a Section 4(f) de minimis finding if a taking or permanent easement is proposed. Otherwise a Section 106 No Adverse Effect finding is not considered to be a “use” of a historic site and no Section 4(f) evaluation is required.

If the Section 4(f) Evaluation identifies a feasible and prudent alternative that completely avoids Section 4(f) properties, it must be selected. If there is no feasible and prudent alternative that avoids all Section 4(f) properties, FHWA has some discretion in selecting the alternative that causes the least overall harm to the 4(f) property and its intended use. FHWA must also find that all possible planning to minimize harm to the Section 4(f) property has occurred.

The projected noise level increase attributed to the Project that may interfere with the use and enjoyment of a noise-sensitive facility must be considered as part of a potential constructive use determination. The types of situations that FHWA has determined a noise-related constructive use would occur include: (1) if a project would affect the ability to hear a performance at an outdoor amphitheater; (2) to sleep in a campground; (3) to enjoy a historic site where quiet is a recognized attribute of the site’s significance; (4) to enjoy an urban park where serenity and quiet are significant attributes; or (5) to view wildlife in an area intended for such. The FHWA has determined a noise-related constructive use does not occur: (1) if the predicted noise levels with the proposed project do not exceed the FHWA Noise Abatement Criteria (NAC) or Federal Transit Administration noise impact criteria; or (2) if the increase in noise due to the proposed project (compared to the No Build condition) is 3 dBA or less even if the noise levels do exceed the FHWA or FTA thresholds.

Preliminary impacts to 4(f) properties were assessed for each Throat Area Variation, as described in the following sections. Each of the variations will result in unavoidable direct use of DCR parkland, and would require a determination of affect under Section 106 to determine whether there is a 4(f) use of an historic property. Only the No Build Alternative will have no effect on Section 4(f) resources. The 4(f) Evaluation to be issued by FHWA as part of the NEPA process will need to determine which variation represents the alternative with the least overall harm.

No Build

In the No Build Alternative, there will be no “use” of any 4(f) properties. The Project will have no effect on the characteristics which make the Charles River Basin Historic District eligible for listing in the National Register and there would be no property acquisitions from any NR-listed or NR-eligible properties. No use of parkland would occur. No further 4(f) review will be required.

I-90 Urban Interchange Preferred Interchange

4(f)

The Preferred Interchange configuration presents an opportunity to create additional parkland space along the Charles River outside the Throat Area. The use of the Houghton Chemical rail spur will be discontinued, and the removal of this segment of rail will allow MassDOT to shift the alignment of SFR away from the Charles River, creating between 6.6 and 7.3 acres of net new open space. The interchange will also provide opportunities to improve access to the parkland parcel along the river. By depressing SFR at the proposed alignment of Cambridge Street South, MassDOT will be able to provide an at-grade bicycle and pedestrian connection to the PDW Path. These benefits are common to all Throat Area Variations.

Noise levels along the PDW Path west of the Throat Area are common to all variations as part of the Preferred Alternative, ranging from 75 to 78 dBA (loudest hour noise level, or Leq) without the proposed Project (2040 No Build condition). All variations will decrease noise levels by up to 13 dBA near the proposed SFR underpass because the retaining walls of the depressed roadway will provide acoustic shielding and receptors on the PDW Path will be farther from SFR and I-90 than in the No Build condition. Noise levels with the Project will still exceed the FHWA Noise Abatement Criteria (NAC) along some portions of the PDW Path west of the Throat Area, but the noise levels will not increase by more than 3 dBA and will not result in a constructive use due to noise. Noise abatement measures, such as noise walls, will not be feasible and reasonable along any portion of the Section 4(f) properties according to MassDOT criteria, as discussed in Section 5.11, and will also potentially have a visual impact within the historic district.

Impacts to existing parkland, as well as additional parkland improvements, vary with each Throat Area Variation, as described in the sections below and shown in Table 5.4.2. For all variations within the Throat Area, direct alteration of DCR-owned land will be required. The level of impairment of parkland functions also varies with all alternatives, including consideration of greenspace as an element of the parkland features. The primary parkland function in this area today is the PDW Path. This multi-use path is frequently used as a commuting route to Boston. MassDOT and the advocacy groups have ensured that the functions of the PDW Path are maintained in all variations.

Historic

The Project work outside the Throat Area will involve no acquisition of historic properties, however, it will have an effect upon the NR-listed Charles River Basin Historic District and the Harvard Avenue Historic District. As discussed in Section 5.6.2.1, shifting SFR away from the river and constructing an underpass for SFR is intended to add parkland to the historic district and provide increased pedestrian access. A new pedestrian bridge over I-90 at Franklin Street will be constructed outside of, but adjacent to, the bounds of the Harvard Avenue Historic District. It is MassDOT’s intention to sensitively design these changes to avoid any adverse effects on the characteristics which make the Charles River Basin and Harvard Avenue Historic Districts NR-eligible. If these changes are found to have no adverse effect on the historic districts, then a de minimis finding could be made under Section 4(f).

3K-HV Variation

3K-HV Section 4(f)

Within the Throat Area, the 3K-HV Variation will shift SFR away from the river and closer to the rail ROW. This provides an opportunity to create a slightly wider usable parkland space along the river. This realignment does not increase overall 4(f) parkland acreage, as the entire parcel is already considered a 4(f) resource. However, it consolidates the open space along the river rather than keeping a green buffer between SFR and the railway, making the open space within the parcel more accessible. There will be approximately 6 to 12 feet of space between SFR and the PDW Path and an increase of the PDW Path from 8.5 to 12 feet in width. The PDW Path will be approximately where it is located today. Figures 5.4-1 and 5.4-2 show parkland uses, and Figure 5.4-3 shows improvements for the 3K-HV Variation.

The viaduct support structures will require 8,750 square feet (sf) of parkland loss due to the placement of the piers on DCR property. The location of the I-90 viaduct in the 3K-HV Throat Area Variation will be the highest and the closest to the PDW Path. The area will be buffered in growing seasons by tree plantings in the planting strips.

3K-HV Historic

The 3K-HV Variation will require the smallest amount of taking from the historic district and most closely retain the existing character of the area. While some piers of the viaduct will encroach within the historic district and the viaduct will slightly overhang the edge of the district, the overall effect will be minor and have minimal effect on the characteristics which make the historic district eligible for NR-listing. Although the 3K-HV Variation will be the only variation which will avoid the removal of the GJR, it will require the realignment of the GJR tracks as they approach the GJR Bridge.

3K-HV Shadow Impacts

To assess any potential for constructive use of Section 4(f) properties, MassDOT also evaluated noise and shading impacts associated with the 3K-HV Variation.

Shadow impacts on the PDW Path will increase slightly compared to existing conditions; however, shadows will only reach PDW Path in the winter, from mid-day through the evening. These areas are already in partial shadow from two high-rise buildings on the BU campus. As winter is the time when the fewest number of pedestrians and cyclists use the PDW Path, the impact will be minimal.

3K-HV Noise Evaluation

Noise levels on the PDW Path in the Throat Area would range from 75 to 77 dBA (Leq) and in Magazine Beach would range from 62 to 68 dBA (Leq) without the Project (2040 No Build).

The 3K-HV Variation will decrease noise levels by 2 to 3 dB along the PDW Path and at Magazine Beach in the Throat Area relative to the No Build condition primarily due to the realignment of SFR to the south approximately 15 feet farther away and the introduction of a 3.5-foot solid concrete wall along the edge of the elevated I-90.

Noise levels with the Project will still exceed the FHWA NAC on this portion of the PDW Path, but the noise levels will not increase by more than 3 dBA and will not result in a constructive use due to noise. The 3K-HV Variation will be similar to the 3K-AMP Variation and both will be quieter than 3K-ABC.

Table 5.4.2: Summary of Potential Section 4(f) Impacts

Variation	Direct	Indirect (Constructive)	Anticipated Historic effect finding	Net Open Space (acres)*
3K-HV	15,250 sf due to I-90 support piers and realignment of GJR	Minimal Shading PDW Path	TBD	7.3 acres: 3.59 transferred to DCR 3.71 new open space
3K- AMP	24,000 sf due to I-90 at grade		TBD	7.3 acres: 3.53 transferred to DCR 3.77 new open space
3K-ABC	47,000 sf due to I-90 at grade		TBD	6.6 acres: 3.22 transferred to DCR 3.28 new open

**Net Open Space includes new open space within DCR property and property to be transferred to DCR, including the relocated Soldiers Field Road*

3K-AMP Variation

3K-AMP Section 4(f)

The at-grade roadway alignment of the 3K-AMP Variation will require a shift in the alignment of SFR. This shift would impact 24,000 square feet (0.5 acres) of parkland. A portion of the land controlled by DCR would be transferred to MassDOT to accommodate I-90 at grade. The rail viaduct's visual impacts to PDW Path users will be less than the 3K-HV Variation, and the GJR viaduct will be lower and further away from the river than the highway viaduct. Use of the viaduct by trains will be less frequent than the use of the viaduct in the 3K-HV Variation by vehicles. At the narrowest sections of the Throat Area, there will be no planted buffer between SFR and the PDW path. There will be approximately 0 to 12 feet of space between SFR and the PDW Path east and west of the narrowest section of the Throat Area for a planting strip. The PDW Path width will be increased from 8.5 to 12 feet and users will be adjacent to 12 lanes of traffic. The PDW Path will be approximately where it is located today. The river bank will remain intact. Figures 5.4-4 and 5.4-5 show parkland use, and Figure 5.4-6 shows mitigation for the 3K-AMP Variation.

3K-AMP Historic

The 3K-AMP Variation will require a greater taking from the historic district than 3K-HV, but less than 3K-ABC. This alternative will require the removal and replacement of the GJR Bridge over SFR. The removal of a contributing structure within a historic district is generally considered an Adverse Effect under Section 106.

3K- AMP Shadow Impacts

The 3K-AMP Variation will not cast any new shadows within the parklands. The existing shadows from the BU buildings will remain.

3K- AMP Noise Evaluation

Noise levels on the PDW Path in the Throat Area would range from 75 to 77 dBA (Leq) and in Magazine Beach would range from 62 to 68 dBA (Leq) without the Project (2040 No Build condition).

The 3K-AMP Variation will decrease noise levels by 1 to 2 dB along PDW Path in the Throat Area and Magazine Beach. Noise levels will be reduced due to a combination of effects. Lowering I-90 will increase noise due to the loss of acoustic shielding provided by the elevated highway, increasing the elevation of SFR eastbound will introduce new acoustic shielding for I-90, and the realignment of SFR approximately 15 feet farther away from the PDW Path will reduce noise levels. Train noise will be reduced slightly due to the shifting of the Worcester Main Line tracks farther from the PDW Path and the increased elevation of the SFR eastbound that will introduce acoustic shielding.

Noise levels with the Project will still exceed the FHWA NAC in the Throat Area of the PDW Path, but the noise levels will not increase by more than 3 dBA and will not result in a constructive use due to noise. The 3K-AMP Variation will be similar to 3K-HV, and both would be quieter than 3K-ABC.

3K-ABC Variation

3K-ABC Section 4(f)

Similar to the 3K-AMP Variation, 3K-ABC will place I-90 at grade and require a conversion of land from DCR ownership to MassDOT ownership. 47,000 sf (1.08 acres) of direct conversion of land from the Commonwealth to MassDOT is anticipated with this shift. The 3K-ABC Variation will provide no separation between the PDW Path and SFR at the narrowest section of the Throat Area, and it will not alleviate the discomfort and perceived lack of safety for path users. There will be approximately 0 to 6 feet of space between SFR and the PDW Path (between the PDW Path and SFR east and west of the narrowest section of the Throat Area) for a planting strip. The PDW Path width will be increased from 8.5 to 12 feet outside the narrowest section of the Throat Area. In the Throat Area, it will remain at the existing width of 8.5 feet. The PDW Path users will be adjacent to 12 lanes of traffic. The highway will be lower than SFR and vehicles will be partially hidden by the grade change, barrier and fencing in between (taller vehicles/trucks will be visible). Figures 5.4-7 and 5.4-8 show parkland uses, and Figure 5.4-9 shows mitigation for 3K-ABC.

3K-ABC Historic

The 3K-ABC Variation will require a more substantial taking from the historic district than either of the preceding variations and will shift I-90 directly within the historic district. This variation will also require the removal and replacement of the GJR Bridge over SFR. The removal of a contributing structure within a historic district is generally considered an Adverse Effect under Section 106. Of the three Throat Area Variations, 3K-ABC will have the most significant effect on the characteristics which make the Charles River Basin Historic District eligible for listing in the National Register.

3K-ABC Shadow Impacts

Variation 3K-ABC will not cast any new shadows within the parklands. The existing shadows from the BU buildings will remain.

3K-ABC Noise Evaluation

Noise levels on the PDW Path in the Throat Area will range from 75 to 77 dBA (Leq). In Magazine Beach, levels will range from 62 to 68 dBA (Leq) without the Project (2040 No Build condition).

Noise levels on the PDW Path in the Throat Area and in Magazine Beach will be approximately 0 to 1 dB lower for the 3K-ABC Variation relative to the No Build condition. Noise levels will not change substantially due to a combination of effects. Lowering I-90 will increase noise due to the loss of acoustic shielding provided by the elevated highway and increasing the elevation of SFR eastbound will introduce new acoustic shielding for I-90. Train noise will be reduced slightly due to the shifting of the Worcester Main Line tracks farther from the PDW path and the increased elevation of the GJR tracks that will introduce acoustic shielding.

Noise levels with the Project will still exceed the FHWA NAC in the Throat Area of the PDW Path, but the noise levels will not increase by more than 3 dBA and will not result in a constructive use due to noise. The 3K-ABC Variation will be louder than both 3K-HV and 3K-AMP.

5.4.6 Article 97 Land Disposition Policy

Article 97 of the Amendments to the Massachusetts Constitution requires special legislative action to approve any proposed disposition of or change in use of parklands. The goal of the Policy is to ensure no net loss of Article 97 lands under the ownership and control of the Commonwealth and its political subdivisions. Specifically, Article 97 requires a two-thirds roll call vote of the Massachusetts House of Representatives and the Massachusetts Senate in order to dispose of or change the use of certain public lands taken or acquired for natural resources purposes.

According to the 1998 EEA Article 97 land disposition Policy, the Executive Office of Energy and Environmental Affairs (EEA) and its agencies shall not support an Article 97 land disposition unless EEA and its agencies determine that exceptional circumstances exist. A determination of “exceptional circumstances” is subject to the following six conditions. Each of the Throat Area Variations results in impacts to public parklands as discussed below. Each will result in unavoidable direct use of DCR parkland. Only the No Build Alternative would have no acquisition of Article 97 land. Each of the variations proposes to shift SFR away from the Charles River outside of DCR-owned land onto land currently owned by Harvard University. At the end of the Project, the land outside of the DCR-owned land will be transferred to DCR.

Some unavoidable impacts to Article 97 land will result from the construction of the Project regardless of which variation is selected. However, the Project will result in a net gain in public parkland. Article 97 land includes all DCR-owned property within the Project Area, as shown on Figure 4.4-1.

Although all three Throat Area Variations will result in impacts to Article 97 land (maximum of 1.08 acres), the removal of the Houghton Chemical rail spur will allow for the creation of new usable public parkland and open space (minimum 3.22 acres).

Compliance with Conditions 1 through 6 of the Article 97 Land Disposition Policy is described below.

Condition 1. All other options to avoid the Article 97 disposition have been explored and no feasible and substantially equivalent alternatives exist (monetary considerations notwithstanding); Note: The purpose of evaluating alternatives is to avoid using/affecting Article 97 land to the extent feasible. To that end, the scope of alternatives under consideration shall be commensurate with the type and size of the proposed disposition of Article 97 land, and must be performed by the proponent of the disposition to the satisfaction of EEA and its agencies. The scope of alternatives extends to any sites that were available at the time the proponent of the Article 97 disposition first notified the controlling agency of the Article 97 land, and which can be reasonably obtained: (a) within the appropriate market area for private proponents, state, and/or regional entities; or (b) within the appropriate city/town for municipal proponents.

The existing I-90 viaduct is located within Article 97 DCR-owned land in a very narrow strip of land between BU and the Charles River. All three Throat Area Variations replace I-90 in essentially the same location as there is no other location within the strip to reconstruct the highway.

The existing I-90 viaduct is supported by piers that are located outside of the DCR Article 97 land. 3K-HV widens the roadway for safety purposes, and therefore, piers are required to support the new highway width. The piers will be located within DCR Article 97 land. Both the 3K-AMP and 3K-ABC Variations locate I-90 at grade with direct impacts from the highway layout.

For the 3K-HV Variation, piers to support I-90 and a portion of a relocated GJR will occupy 15,250 sf of DCR property. Both the 3K-AMP and 3K-ABC Variations locate a portion of I-90 at-grade within DCR property. The 3K-AMP Variation will occupy 24,000 sf of DCR property, and the 3K-ABC Variation will occupy 47,000 sf.

The impact to Article 97 land is unavoidable due to space constraints, however, the reconstruction of I-90 will essentially be in the same location, only the width varies based on the selected Throat Area Variation.

As previously described, the use of the Houghton Chemical rail spur will be discontinued, as part of a private transaction that is not part of the Project. The removal of this segment of rail allows for a shift in the alignment of SFR away from the Charles River, creating acres of new usable parkland and open space. The Project will also provide opportunities to improve access to the parkland parcel along the river by depressing SFR at the proposed alignment of Cambridge Street South, allowing for an at-grade bicycle and pedestrian connection to the PDW Path. These benefits are common to all three Throat Area Variations. All three variations have been optimized to enhance the existing Article 97 land. All of them present an opportunity to create additional parkland along the Charles River outside of the Throat Area.

Condition 2. The disposition of the subject parcel and its proposed use do not destroy or threaten a unique or significant resource (e.g., significant habitat, rare or unusual terrain, or areas of significant public recreation), as determined by EEA and its agencies.

The disposition of land will not destroy, but will enhance, a unique and significant resource in terms of public uses and interests by creating pubic parkland along the west side of the Charles River. The Throat Area Variations create between 4.28 and 4.87 acres of publicly accessible parkland where little exists today. The new created parkland will become a destination where the public can gather.

Condition 3. As part of the disposition, real estate of equal or greater fair market value or value in use of proposed use, whichever is greater, and significantly greater resource value as determined by EEA and its agencies, are granted to the disposing agency or its designee, so that the mission and legal mandate of EEA and its agencies and the constitutional rights of the citizens of Massachusetts are protected and enhanced.

Real estate of significantly greater value, especially after the parkland improvements proposed by the Project are realized, will be granted to the DCR as part of the Project. Table 5.4.3 summarizes the impacts and proposed compensatory land. The ability to create public parkland is a valuable resource that will provide a significant benefit to the entire Allston region by providing contiguous parkland along the west side of the Charles River.

Table 5.4.3: Article 97 Impacts and Compensation

Variation	Article 97 DCR Property Impact	Compensatory Land Composition and Size
3K-HV	15,250 square feet (0.35 acres)	**New Parkland:** 1.07 acres **Relocated SFR:** 2.52 acres **Total:** 3.59 acres
3K-AMP	24,000 square feet 0.55 (acres)	**New Parkland:** 1.16 acres **Relocated SFR:** 2.37 acres **Total:** 3.53 acres
3K- ABC	47,000 square feet (1.08 acres)	**New Parkland:** 0.92 acres **Relocated SFR:** 2.3 acres **Total:** 3.22 Acres

Condition 4. The minimum acreage necessary for the proposed use is proposed for disposition and, to the maximum extent possible, the resources of the parcel proposed for disposition continue to be protected.

Under all three Throat Area Variations, the impacts to Article 97 lands represent the minimum acreage necessary for disposition in terms of highway design requirements and public safety. After the disposition, the DCR parcel will be enlarged and will continue to be protected as DCR parkland.

Condition 5. The disposition serves an Article 97 purpose or another public purpose without detracting from the mission, plans, policies and mandates of EEA and its appropriate department or division.

Under the three Throat Area Variations, the disposition of Article 97 lands serves the public purpose of transportation. The Project was designed to serve the missions, plans, policies and mandates of EEA and DCR.

Condition 6. The disposition of a parcel is not contrary to the express wishes of the person(s) who donated or sold the parcel or interests therein to the Commonwealth.

Under Chapter 365 of the Acts of 1926, the Metropolitan District Commission was authorized to construct a portion of SFR from Bay State Road to North Harvard Street in the City of Boston. The Project Area includes a portion of SFR and parkland acquired by the Metropolitan Park Commission in the late 1800s and early 1900s.

5.5 Socioeconomic

This section of the document analyzes how the Project will impact regional and local social and economic conditions.

Regional Socioeconomic Impacts

This section compares the socioeconomic impacts of the Preferred Alternative 2040 Build versus the No Build Alternative. The regional socioeconomic impacts do not vary among the Throat Area Variations.

A multi-criteria economic evaluation indicates that the Project will improve transportation efficiency and unlock the potential for substantial future development by Harvard in BPY, which will be made available by the interchange reconfiguration. When fully developed, the Project could support as many as 9,940 jobs in the region and provide at least 3.2 times as many monetized benefits to users as it will cost to deliver the proposed infrastructure upgrades.

The geographic context for this evaluation encompasses the five counties in the Central Transportation Planning Staff (CTPS) regional model used for this project: Suffolk, Norfolk, Middlesex, Worcester and Essex. The Socioeconomic Data provided in Appendix D provides figures showing daily total origin and destination trips using the interchange on- and off-ramps under 2040 Full Build land use scenario. The data indicate that the Project Area has a broad geographic area of influence.

The economic analysis recognizes how households and businesses can take advantage of lower direct costs of transportation and improvements in travel time and reliability. The major input to this analysis is the annual performance of the transportation system, generated from CTPS's regional travel demand model (TDM). For more information on the evaluation of TDM inputs to estimate economic effects, see Socioeconomic Data, Appendix D.

To better understand the impact of the Project, two scenarios were modeled comparing the 2040 Full Build to No Build Alternatives. Assumptions for the Project Build Alternatives are as follows:

- **Scenario 1:** 2040 street network without Harvard's development of BPY. This scenario enables a straightforward comparison of the Project's impact on jobs, business output, household incomes and taxes, and user benefits and costs. It is based strictly on the extent to which the Build scenario changes travel times (accessibility), vehicle miles traveled, and other transportation measures compared to the existing (No Build) street network.
- **Scenario 2:** 2040 street network with Harvard's development of BPY. The scenario includes additional auto and truck trips that will be generated by new development within BPY, and made possible by implementation of the Project. These additional trips will erode some travel time and other transportation benefits impacts of the 2040 Build network, but add the economic benefits of BPY development.

5.5.1 Economic Impact Analysis

Scenario 1 isolates how the Project addresses existing transportation inefficiencies in the region. The Project improves the alignment of I-90 and local street network connections. This benefits both users of I-90 traveling between other parts of the metro region, and travelers using I-90 to reach destinations near the Project in Cambridge and Allston/Brighton. Because the facilities are designed to handle local traffic from the development of the BPY, which does not exist under this land use scenario, travel for users of the facilities will be very efficient. Table 5.5.1 shows the economic impacts associated with improving the transportation network for the Project's 2040 Build. Appendix D, Socioeconomic Data, shows how impacts are distributed across industry sectors and industry sectors over time.

Scenario 1 occurs if Harvard does not carry out its development of the BPY, even as this development is assumed for traffic modeling and design purposes by 2040. The increases in business output, value added, jobs and household income shown in Table 5.5.1 estimate the total direct, indirect and induced economic of productivity gains as a consequence of accessibility improvements, and are therefore, considered net new to the region. The new accessibility could also attract other forms of development that will take advantage of the travel benefit, if Harvard's presumed development fails to materialize. While such development might be new to the local area, it may also represent a redistribution of growth that could occur elsewhere in the region. While the type of development is uncertain, based on the underlying zoning and publicly available planning, in this analysis, Harvard's development of the BPY is presumed to be largely institutionally related. It would most likely represent growth that might not otherwise occur within the region.

Table 5.5.1: Scenario 1: 2040 Street Network without Harvard's Development of BPY

Business Output ($M)	Value Added ($M)	Employment	Labor Income ($M)
143.0	90.0	810	62.0

Scenario 2 includes impacts from the transportation improvement and development of the land made available by the Project. Table 5.5.2 shows over one billion dollars of new gross regional product (value added) and 9,940 new jobs enabled by the Project in 2040. The Socioeconomic Data Appendix D provides additional information about transportation effects over time and the industry sectors affected by this Project scenario.

The local development associated with the Project increases local traffic, and therefore, slightly reduces the regional benefits of transportation efficiency improvements. However, the economic impacts of the direct jobs expected to be sited on the land made available, and the indirect and induced jobs they support, represent a much larger impact, such that total economic impacts are more than 10 times the infrastructure-only scenario results. This highlights the importance of evaluating the Project based on multiple criteria, including economic impacts from both transportation improvement and development. The 5,425 jobs estimated to develop in the Project footprint also support significant economic vitality elsewhere in the region. (For details, see CTPS land use memo in the Allston Interchange Traffic Operations Study Appendix C-3). As noted, to be counted as net new economic activity in the region, this development would have to be driven by investments in institutional and related capacity that would not otherwise occur in the region.

Table 5.5.2: Scenario 2: 2040 Street Network with Harvard's Development of BPY

Business Output ($M)	Value Added ($M)	Employment	Labor Income ($M)
1,915.0	1,219.2	9,940	867.8

In addition to the transportation efficiency and development impacts discussed above, there is a further economic impact from the Project related to the construction expenditures associated with the baseline and Project Alternatives. Significant construction outlays are required to simply keep I-90 open to traffic under the existing configuration of the interchange, as the Allston Interchange is an aging facility, with viaduct and structural components approaching the end of their useful life. Appendix D, Socioeconomic Data, discusses the cost profiles used for the full build-out of the Project, (which improves transportation and enables development), and the base case rehabilitation of the existing geometry. The regional economic impacts of investing additional resources to deliver the full build-out of the Project are displayed in Table 5.5.3. Unlike the economic impacts shown for Scenario 1 (Table 5.5.1) and 2 (Table 5.5.2), the construction period effects are one-time only and do not recur annually. The roadways shown to be completed by the Project are required to support traffic projections for Scenarios 1 and 2.

Table 5.5.3: Total Cumulative Economic Impacts of Construction Spending Over the 6.5 Year Period

Business Output ($M)	Value Added ($M)	Employment	Labor Income ($M)
867.0	475.0	4,910	345.0

** On average, this corresponds to about 750 workers in a given year over 6.5 years.*

5.5.2 Benefit-Cost Analysis

Benefit-cost analysis is a commonly used public infrastructure project evaluation framework that provides information about the societal value of a project relative to its costs. If a project does not provide a benefit-cost ratio above 1.0, it is generally not considered a good use of public funds. This Project surpasses that hurdle, with more than twice as many benefits as costs even at the higher of the two discount rates required by federal regulation for project evaluation. Table 5.5.4 shows several different key benefit-cost measures for each scenario analyzed at both recommended discount rates.

When looking only at the transportation improvement portion of the Project (no development), the efficiency impact is more noticeable before adding traffic associated with new development in BPY. Benefit-cost analysis does not consider the value of development in the Project footprint. When focusing only on benefits to regional travel, and not adding in new local trips, the Project generates a benefit-cost ratio as high as 8.75. However, it is more appropriate to assess the complete scenario since Harvard's presumed future development of BPY, in large part, drives the design solutions. In this case, some of the travel time saving and other routing efficiencies are eroded by more local traffic.

When considering both the societal benefits and costs of the complete development scenario, the Project generates a benefit-cost ratio of 3.22. With benefit-cost ratios over 1.0 and the previously discussed economic impacts, the economic evaluation provides an economic rationale for the Project from a multi-criteria perspective, as well as any single perspective.

Table 5.5.4. Benefit-Cost Analysis for the Two Scenarios

Evaluation Measures	Scenario 1		Scenario 2	
	3% Discount	7% Discount	3% Discount	7% Discount
Present Value of Benefit Stream ($M)	$2,901.6	$1,659.2	$1,067.9	$610.6
Present Value of Cost Stream ($M)	$331.6	$295.7	$331.6	$295.7
Net Present Value (Benefits - Costs) ($M)	$2,570.0	$1,363.5	$736.3	$315.0
Benefit Cost Ratio (Benefits / Costs)	8.75	5.61	3.22	2.07

Scenario 1: 2040 street network without Harvard's development of BPY. Scenario 2: 2040 street network with Harvard's development of BPY.

5.5.3 Tax Impacts

In addition to economic impacts on the regional economy and benefit-cost analysis, the economic evaluation identifies future tax revenue impacts due to additional economic activity in the region. Table 5.5.5 summarizes the state and local tax impacts estimated to result from the full build-out scenario in 2040.

Table 5.5.5. Tax Revenue Impacts of New Development and Transportation Improvements in 2040

Income Tax ($M)	Sales Tax ($M)	Miscellaneous ($M)	Total ($M)
12.9	18.1	4.3	35.3

5.5.4 Socioeconomic Impacts of Pedestrian and Bicycle Facilities

The changes and improvements in pedestrian and bicycle facilities associated with the Project fit into the broader framework for making the city more bike- and pedestrian-friendly. On the bicycle side, the Boston Bike Network Plan, adopted by the City of Boston in 2013, laid out a 30-year master plan to expand and improve the existing bicycle network. Most of the bicycle network facilities envisioned by the Boston Bike Network Plan for the Allston neighborhood have been implemented, but other improvements of the network are still in the planning stages, independent of the Project. For example, MassDOT proposes to upgrade bicycle connections between Allston and Cambridge in a two-bridge rehabilitation project.

Within portions of the Throat Area, Variations 3K-HV and 3K-AMP include the widening of the PDW Path from 8.5 to 12 feet. The PDW Path in 3K-ABC will be 8.5 feet in width. Further options deal with the construction of Americans with Disabilities Act/Architectural Access Board (ADA/AAB) compliant ramp for the PDW Path to a potential future GJR path and at the southerly abutment of the railroad bridge over the Charles River. For the 3K-ABC Variation, the outcome will be similar, but this variation aligns the PDW Path towards, and in some sections, within the Charles River.

The proposed bicycle and pedestrian facilities, depending on the specifics of implementation, provide opportunities for the following benefits compared to the No Build Alternative:

- The Project design proposes north-south and east-west connectivity routes that do not currently exist for both bicyclists and pedestrians. The No Build Alternative does not include these routes. Improved connectivity will provide lower-cost access to jobs, educational opportunities, retail stores, healthcare facilities, recreational opportunities, physical activity and health, neighborhood livability, and may increase property values and business sales. Recent case studies have documented, for example, the increased retail spending of cyclists compared to auto arrivals, increased property values following separated bike lane facilities, and the greater attractiveness of neighborhoods with safe and convenient pedestrian and bicycle accessibility for many labor force participants. These increases make an area more attractive for new business.
- Separated bicycle lanes encourage less experienced cyclists to travel more frequently by bike because they offer safe separation from both vehicular and pedestrian traffic. A buffer strip, either planted or with a striated surface, is proposed between the sidewalk and the bicycle lane. A separating buffer strip is also proposed between the bicycle lane and the travel lane. A raised curb and a five-foot-wide shoulder further separates the bicycle lane from vehicular traffic. These improvements will have positive effects on safety for both pedestrians and cyclists.
- The proposed design will create separate crosswalks for pedestrians and cyclists at intersections where the geometry is feasible, thereby increasing safety. This element will be developed further in the final design.
- Other elements include specific provisions for pedestrian crosswalks across bicycle lanes, with similar impacts on safety and accessibility.

This brief review of the additional pedestrian and bicycle facilities incorporated in the design alternatives of the Project provides an opportunity to measure the benefits and costs of these provisions. Assessing the likely performance of pedestrian and bicycle facilities under the Project, however, will require the application of a set of

> **Timeline:** If the SHPO concurs with the No Adverse Effect finding after the 30-day review period, no further Section 106 review is required.

Adverse Effect: When the agency official, after consultation with the SHPO, finds that the "undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, settings, materials, workmanship, feeling or association." Examples include, but are not limited to, physical destruction of or damage to all or part of the property; alteration of a property that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68); removal of the property from its historic location; changes to the character of the property's use or physical features that contribute to its historic significance; and introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's historic features.

In the event the Project is found to have an adverse effect on historic properties, consultation will continue between FHWA, MassDOT, the SHPO and any other consulting parties "to develop and evaluate alternatives or modifications that could avoid minimize or mitigate adverse effects on historic properties." The Advisory Council on Historic Preservation (ACHP) must be notified of the adverse effect and invited to participate in consultation.

> **Timeline:** After the initial 30-day review period afforded to the SHPO, and a 15-day period during which the ACHP must notify FHWA whether it will participate in consultation, there are no regulatory deadlines associated with resolving an adverse effect. FHWA will not approve a project until the Section 106 and Section 4(f) reviews are complete. **The schedule delays and uncertainty that an adverse effect finding introduces into a project schedule can be significant.**

The Project covers a significant swath of Allston, however, the Project's potential impacts to impact historic properties will be confined to the edges of the Project Area. The bulk of the Project work – reconstructing the interchange, reconfiguring its ramps, constructing West Station and reconfiguring rail operations – will have essentially no impact on historic properties. It is at the Project's edges, primarily in areas where the Project seeks to improve access for pedestrians and cyclists, where the Project comes into contact with historic resources. Reconfiguring SFR to increase parkland and reconstructing the Franklin Street overpass have been designed with the historic context of, respectively, the NR-listed Charles River Basin Historic District and the Harvard Avenue Historic District in mind.

The Project's most significant effect on historic resources will be within the Charles River Basin Historic District, which is listed in the National Register of Historic Resources. SFR, the PDW Path and the GJR Bridge over SFR are all contributing properties within the historic district that will be impacted by construction. The proposed plan to shift SFR away from the river and construct an underpass will impact the historic district but through the creation of additional parkland and a new at-grade connection to the river, it is MassDOT's intention that the proposed work will not adversely affect the character of the historic district.

The three Throat Area Variations require further careful evaluation to determine which variation will have the least effect on the characteristics which make the Charles River Basin Historic District eligible for listing in the National Register.

5.6.1 No Build

The No Build Alternative will have no effect on any of the NR-listed and NR-eligible properties within the APE identified in Section 4.6, and therefore, would have no effect on any of the characteristics which make them eligible for listing in the National Register.

5.6.2 I-90 Urban Interchange Preferred Alternative

5.6.2.1 Highway and Streets

Reconstructing the I-90 interchange and the portion of the interstate outside the Throat Area will have little effect on historic resources with two exceptions: (1) constructing a new SFR underpass and shifting the parkway's alignment will impact the Charles River Basin Historic District; and (2) constructing a new bridge to replace the Franklin Street pedestrian bridge will effect the Harvard Avenue Historic District. See Figures 5.6-1 through 5.6-3.

SFR Underpass & Realignment

The section of SFR and the PDW Path between the BU Bridge and Cambridge Street/River Street has been severely constricted throughout its history by BPY, and later, I-90. Unlike the areas of the Charles River Basin Historic District to the east of the BU Bridge, this segment of the historic district has virtually no parkland. This section of the basin is also part of a lengthy gap between ADA-compliant access points to the parkland. Reconfiguring the I-90 interchange creates an opportunity to add parkland and increase access in this section of the Charles River Basin.

Constructing a new underpass and shifting the alignment of SFR will have the dual benefit of providing a new at-grade connection for pedestrians and bicyclists to the Charles River while also creating additional parkland next to the river. Underpasses have been a part of the Charles River parkways since 1931 when the MIT Memorial Underpass was constructed. On the Boston side of the river, SFR and Storrow Drive together have five underpasses at Leverett Circle, Cambridge Street/River Street, Western Avenue, North Harvard Street, and between Berkeley and Clarendon Streets. Construction of a new underpass will be in keeping with a history of underpasses on the parkway, avoid the need for a new pedestrian bridge, and provide pedestrians and bicyclists with a direct connection to the river. In addition, depressing SFR will reduce noise levels on the PDW path by 8-12 decibels. Any stormwater treatment structures to be added to the newly created parkland will be sensitively designed to be in keeping with the character of the historic district.

By shifting the alignment of SFR away from the river, the proposed underpass and its associated ramps will be almost entirely outside the existing bounds of the Charles River Basin Historic District and between 3.22 and 3.59 acres of land will be added to the district. The creation of new parkland is in keeping with the spirit of those who established the Charles River Reservation and fulfills a longstanding desire for additional parkland in this section of the river. It is MassDOT's opinion that with a context-sensitive design, this Project work will avoid introducing any adverse effects on the characteristics which make the Charles River Basin Historic District eligible for listing in the National Register.

Franklin Street Pedestrian Bridge

The existing Franklin Street Pedestrian Bridge extends into the NR-listed Harvard Avenue Historic District, however, it is not a contributing resource within the district. While its removal will not adversely affect the district, its replacement will need to be context sensitive to avoid an adverse effect under Section 106.

The replacement bridge cannot be placed on the same alignment as the existing bridge due to ADA/AAB issues (see Section 3.1.3). The proposed alignment will move the southern terminus of the bridge to the parcel at 2-30 Franklin Street, adjacent to the western end of the Allston Depot, but outside the bounds of that property and the Harvard Avenue Historic District. The proposed alignment of the new bridge will allow pedestrians to follow a relatively straight path to their destination and will avoid impacts within the historic district. It will require the demolition of the building at 20-30 Franklin Street, which in MassDOT's opinion, is not eligible for listing in the National Register, either individually or as part of the Harvard Avenue Historic District (See Section 4.6 for further discussion.) An alternative that was considered would have essentially kept the pedestrian bridge on its existing alignment, but would have extended the access ramp along the edge of the Allston Depot property and required a permanent acquisition.

As shown on Figures 5.6-1 through 5.6-3, the proposed replacement of the Franklin Street pedestrian bridge will involve the construction of a new bridge adjacent to, but outside the bounds of, the NR-listed Harvard Avenue Historic District. A context-sensitive design of the new bridge will avoid any adverse effect on the historic district.

5.6.2.2 Rail Operations

Rail operations have been conducted at this location for more than 100 years. No historic resources associated with BPY survive, and the continued rail operation will have no effect on any NR-listed and NR-eligible properties within the Project's APE.

5.6.2.3 West Station

Construction of West Station will have little to no effect on any NR-listed or NR-eligible properties. The new station may be visible from points within the Charles River Basin Historic District, however, it will be seen against a back-drop of buildings on Ashford Street and beyond. It will not materially alter the existing views and future development will likely block even these limited views of the station.

5.6.3 Throat Area Variations

Project elements within the Throat Area will have direct impacts on the NR-listed Charles River Basin Historic District. The following is an evaluation of the various impacts each variation will have on the historic district.

3K-HV Variation

Pros:

- Smallest taking from the Charles River Basin Historic District
- New parkland created between PDW Path and SFR
- GJR Bridge over SFR is retained

Cons:

- Highway viaduct is immediately adjacent to, and slightly overhanging, SFR
- Viaduct piers are located within the Charles River Basin Historic District
- Loss of vegetated strip between SFR and rail
- Minor increase in shadow impacts over existing conditions

As shown on Figures 5.4-1 and 5.6-1, the 3K-HV Variation will result in the smallest taking from the Charles River Basin Historic District. Direct impacts will be confined to 8,750 sf of taking and associated easement where viaduct piers will be constructed, and the alignment of the GJR will be slightly shifted within the Charles River Basin Historic District. A narrow portion of the viaduct, approximately 6,100 sf, will cantilever over the historic district. At the narrowest point of the Throat Area, the new viaduct would be approximately 8 feet closer to SFR than the existing viaduct; it will remain at approximately the same height. SFR will be shifted away from the river to allow for a vegetated strip, varying in width from 6 to 12 feet, to be constructed as a buffer between SFR and the PDW Path in locations where there is no existing landscaping.

This variation does not require the replacement of the GJR Bridge over SFR, which appears to be a contributing structure within the NR-Charles River Basin Historic District. The southern railway approach to the GJR will need to be slightly realigned to the north, resulting in a 6,500 sf impact within the historic district.

While the viaduct does not contribute to the character of the historic district, its reconstruction will essentially maintain conditions that existed at the time the Charles River Basin was added to the National Register. The buildings on the BU campus that stand behind the viaduct are tall and substantial and will continue to provide a structural backdrop to the historic district regardless of whether the viaduct is rebuilt.

Shadow Impacts

Shadow impacts on the PDW Path will increase slightly from existing conditions, however, shadows will only reach the path in the winter, from mid-day through the evening. SFR will be in partial shadow in the afternoon throughout the year, except during winter when it will be in full shadow from mid-day through the evening. The historic district is already in partial shadow from two high-rise buildings on the BU campus. As winter is the time when the fewest number of pedestrian and bicyclists use the PDW Path, and the impact is minimal, shadow impacts do not seem to be a significant differentiating factor between the three Throat Area Variations.

Noise Impacts

The 3K-HV Variation will result in slightly lower noise levels on the PDW Path than existing conditions due to the shifting of SFR away from the path and the introduction of a 3.5-foot parapet wall at the edge of the elevated highway. Both the 3K-HV and 3K-AMP Variations will have the lowest noise levels of the three Throat Area Variations.

3K-AMP Variation

Pros:

- Rail viaduct is lower and further from SFR than highway viaduct
- Will provide partial separation of PDW Path and SFR
- Reduced shadow impacts compared to existing conditions
- Additional access point for pedestrians and cyclists to the river

Cons:

- Approximately 24,000 sf of I-90 will be shifted into the historic district
- I-90 is immediately adjacent to SFR, separated by a concrete barrier
- The eastbound lanes of SFR will be elevated above the westbound lanes and a concrete barrier will separate the two barrels
- GJR Bridge over SFR will be replaced
- Loss of vegetated strip between SFR and rail

I-90 and SFR

The 3K-AMP Variation will retain a viaduct structure but it will be lower and further from SFR than 3K-HV. The 3K-AMP rail viaduct will have less visual impact on the historic district than the 3K-HV highway viaduct, however, the physical encroachment of the interstate within the historic district will be more significant. As shown on Figure 5.4-4 and 5.6-2, 3K-AMP will shift approximately 24,000 sf of the interstate into the historic district. The eastbound lanes of SFR will be raised approximately 4 feet above the westbound lanes of SFR and separated by a concrete barrier. The interstate will be located immediately adjacent to SFR, separated by a crash barrier. Each travel lane carried by SFR will be narrowed from 11 feet to 10 feet, and the existing barrier between the two barrels of the roadway will be reduced from 4 feet to 3 feet, resulting in an overall 5-foot reduction in the width of SFR.

There will be approximately 0 to 12 feet of space for a planting strip between SFR and the PDW Path, east and west of the narrowest section of the Throat Area. The PDW Path will be increased from 8.5 to 12 feet and users will be adjacent to 12 lanes of traffic. 3K-AMP will introduce an additional pedestrian and bicyclist access point to the Charles River Reservation, which will require the construction of a new ramp in the triangular area between the BU Bridge, SFR and the GJR.

This alternative requires the replacement of the GJR Bridge over SFR, which appears to be a contributing structure within the NR-listed Charles River Basin Historic District. It is MassDOT's opinion that its replacement would be considered an Adverse Effect under Section 106.

Shadow Impacts

The 3K-AMP Variation will not cast any shadows within the historic district. The existing shadows from the BU buildings will remain.

Noise Impacts

Noise levels on the PDW Path for the 3K-AMP Variation will be slightly lower than existing conditions and similar to the 3K-HV Variation. This is due to a combination of effects including the loss of acoustical shielding provided by the viaduct, shifting SFR farther away from the path, and elevating SFR eastbound to provide acoustic shielding to the at-grade I-90. Noise abatement measures such as a noise wall may not be feasible from an engineering standpoint (as discussed in Section 5.11), but will also have a detrimental impact on the historic district.

3K-ABC Variation

Pros:

- No viaduct structure will be required; the rail will be on a filled embankment lower and further from SFR than either the rail or highway viaducts.
- Reduced shadow impacts compared to existing conditions

Cons:

- Approximately 47,000 sf of the interstate would be shifted into the historic district
- Requires the largest taking from the Charles River Basin Historic District
- The PDW Path will be separated from SFR by a concrete barrier rather than the current guardrail configuration.
- The eastbound lanes of SFR will be elevated above the westbound lanes and a concrete barrier will separate the two barrels.
- I-90 will be immediately adjacent to SFR and separated by a concrete barrier.
- The PDW Path will impact Charles River resource areas.
- The GJR Bridge over SFR will be replaced.
- No new landscaped areas will be created within the narrowest section of the Throat Area.
- All vegetated strips between SFR and the rail and between PDW Path and the river will be lost at the narrowest points.

The 3K-ABC Variation will eliminate the need for any viaduct structures but it will require the largest taking from the historic district. As shown on Figure 5.4-7 and 5.6-3, the 3K-ABC Variation will shift approximately 47,000 sf of the interstate into the historic district. The eastbound lanes of SFR will be raised approximately 4 feet above the westbound lanes of SFR and separated by a concrete barrier. I-90 will be located at the same approximate height as the existing SFR; the two roadways will be separated by a wall/crash barrier. The rail will be on a filled embankment which will be lower and further away from the historic district than either the 3K-HV and 3K-AMP Variations. The PDW Path will be located along the existing embankment. All vegetation and planting strips within narrowest points of the Throat Area will be removed. No vestige of a parkway will survive within this section of the historic district.

The 3K-ABC Variation will require the replacement of the GJR Bridge over SFR, which appears to be a contributing structure within the NR-listed Charles River Basin Historic District. It is MassDOT's opinion that its replacement would be considered an Adverse Effect under Section 106. This variation will also result in the most significant alterations to the character of the NR-listed Charles River Basin Historic District.

Shadow Impacts

The 3K-ABC Variation will not cast any shadows within the historic district. The existing shadows from the BU buildings will remain.

Noise Impacts

Noise levels along the PDW Path will be slightly lower than existing conditions for the 3K-ABC Variation and approximately 1 to 2 decibels higher than the 3K-HV and 3K-AMP Variations. This is due to a combination of effects including the loss of acoustical shielding provided by the viaduct, and elevating SFR eastbound to provide acoustic shielding to the at-grade I-90. As discussed above, noise abatement measures will not only be challenging from an engineering perspective, but will have an adverse impact on the character of the historic district.

5.6.4 Summary of Preferred Alternative and Throat Variation Impacts

All three Throat Area Variations will impact the Charles River Historic District, however, the degree and nature of the impact varies significantly. The 3K-HV Variation will require the smallest amount of taking from the historic district and will most closely retain the existing character of the area. The vegetated strip between SFR and the viaduct/rail will be shifted to a more accessible location between the PDW Path and SFR where vegetation will have more favorable growing conditions. While some viaduct piers will encroach within the historic district, the overall effect will be minor and have minimal effect on the characteristics which make the historic district eligible for listing in the National Register. Although the GJR rail approach to the GJR Bridge will be realigned, the 3K-HV Variation is the only alternative that will avoid the removal and replacement of the GJR Bridge over SFR. The removal of a contributing structure within a historic district is generally considered an Adverse Effect under Section 106.

The 3K-AMP Variation will require a greater taking from the historic district than the 3K-HV Variation but less than the 3K-ABC Variation. The interstate will be shifted directly into the historic district. It will retain a viaduct, but it will be lower and further from the district than the 3K-HV Variation. Vegetation at the Charles River embankment will remain and a new vegetated strip will provide a buffer between the PDW Path and SFR in a portion of the Throat Area. This variation will require the removal and replacement of the GJR Bridge over SFR.

The 3K-ABC Variation will require a more substantial taking from the historic district and shift the interstate directly within the historic district. The character of the district will be impacted by the removal of all vegetation within the Throat Area. The main advantage of this variation is the removal of a viaduct structure but this advantage will be somewhat lessened by the built environment that will still be the southern backdrop of the historic district. This variation will also require the removal of the GJR Bridge over SFR. Of the three Throat Area Variations, 3K-ABC will have the most significant effect on the characteristics which make the Charles River Basin Historic District eligible for listing in the National Register.

The Project will not affect any potentially significant archaeological resources based on the results of the archaeological surveys in the area, the historic filling and development of the riverfront area, and the extensive disturbance and contamination related to railroad, industrial, and interstate construction and use within the APE.

5.7 Bicycle and Pedestrian Facilities

This section discusses the bicycle and pedestrian facilities proposed for the No Build, I-90 Urban Interchange Preferred Alternative and three Throat Area Variations. The street network will provide key east/west pedestrian and bicycle connections along Cambridge Street South accommodating a direct link between the North Allston neighborhood and the Charles River Reservation/PDW Path.

In addition, two bridges will be constructed to form important north/south connections through the Project Area providing accommodations between the neighborhoods north of Cambridge Street in North Allston to Commonwealth Avenue in the Packards Corner area. A third bridge will replace the existing Franklin Street pedestrian bridge over I-90 and the Worcester Line, connecting North Allston with Allston Village. It will be a highly visible structure and provide an opportunity to create a gateway element for the neighborhood.

5.7.1 2040 No Build

The existing bicycle and pedestrian network lacks direct, north-south connections from the neighborhoods south of the BPY to the Charles River through the Project Area. Under the No Build Alternative, these connectivity issues will continue to be challenging for pedestrians and bicyclists alike. The existing pedestrian and bicycle connection over the Worcester Main Line at the Franklin Street Pedestrian Bridge will remain in place.

5.7.1.1 2040 No Build Bicycle Facilities

The bicycle facility network within the Project Study Area, previously defined in the 2040 No Build condition will, in general, be similar to the existing bicycle network. However, there are likely to be enhancements to the bicycle network that will occur within Harvard University's Allston Campus and Enterprise Zone by 2040 as Harvard redevelops that area.

In 2013, the City of Boston issued the *Boston Bike Network Plan,* a 30-year master plan to expand the existing bicycle network within the city. Within the Allston neighborhood, most of the bicycle network facilities envisioned by the Boston Bike Network Plan have been implemented. Within proximity of the Project Study Area, the expected changes to the bicycle network by 2040 assumed for this analysis include following:

- **Commonwealth Avenue (Alcorn Street to BU Bridge):** Upgrade of in-street bicycle lanes to separated bicycle facilities
- **Braintree Street/Guest Street Corridor (Cambridge Street/Harvard Avenue west to Market Street):** Addition of some type of bicycle facilities (bike lanes or separated bike facility)

A map illustrating the City's long-range vision for the future Bicycle Network can be found at the following web site:

http://www.cityofboston.gov/images_documents/Boston%20Bike%20Network%20Plan%2C%20Fall%202013_FINAL_tcm3-40525.pdf

In its 10-year IMP Harvard identified locations or corridors for potential bicycle facilities that are likely to be implemented prior to 2040. These facilities will be part of the No Build transportation network. Detailed information pertaining to future bicycle accommodations within Harvard's Allston Campus can be found in the Harvard IMP document and at the following web site:

http://home.hppm.harvard.edu/files/hppm/files/harvard_imp_2013_0.pdf

MassDOT will also upgrade bicycle connections between Allston and Cambridge in a two-bridge rehabilitation project. Under Project No. 605527, a one-way cycle track operating in the same eastbound direction as vehicular traffic is proposed on the River Street Bridge over the Charles River. To address the westbound direction, the Western Avenue Bridge over the Charles River is also rehabilitated under the same project. It will include a new 5-foot-wide, one-way cycle track.

5.7.1.2 2040 No Build Pedestrian Facilities

Similar to the bicycle facilities, changes in the Project Study Area's pedestrian facilities and connections will not occur between the 2015 existing conditions and the 2040 No Build condition. The noteworthy exception is within Harvard's Allston Campus and Enterprise Zone, where development/redevelopment over the next 20 years will provide many opportunities for Harvard University to create a strong network of pedestrian facilities within those campuses. For example, pedestrian (and bicycle) facilities will most likely be constructed along the Stadium Way corridor. More details regarding future pedestrian corridors, facilities and amenities within Harvard's Allston Campus can be found in Harvard's IMP document referenced above.

5.7.2 2025 Opening Year

Project bicycle facilities provide neighborhood, transit, commuting and existing network connectivity that promotes increased bicycle use. They also align with the *Healthy Transportation Policy Directive* of increasing and encouraging more bicycle trips with the goal of tripling bicycle use in Massachusetts by 2030.

Studies have shown that a lack of separation between bicycles and high-volume, high-speed vehicular traffic is a deterrent to increasing the interest of the general population to bicycle. The recent Commonwealth Avenue project, the existing PDW Path and Western Avenue, all of which border the Project Area, provide separation between vehicular traffic and bicycle traffic, albeit in different ways. To meet the goals of the Project, the proposed bicycle facilities that connect to these existing bicycle facilities are designed to at least a comparable degree of separation. The completed bicycle network, with the new interchange Project centered within it, reflects a separated design approach that is consistent with the bordering connective networks.

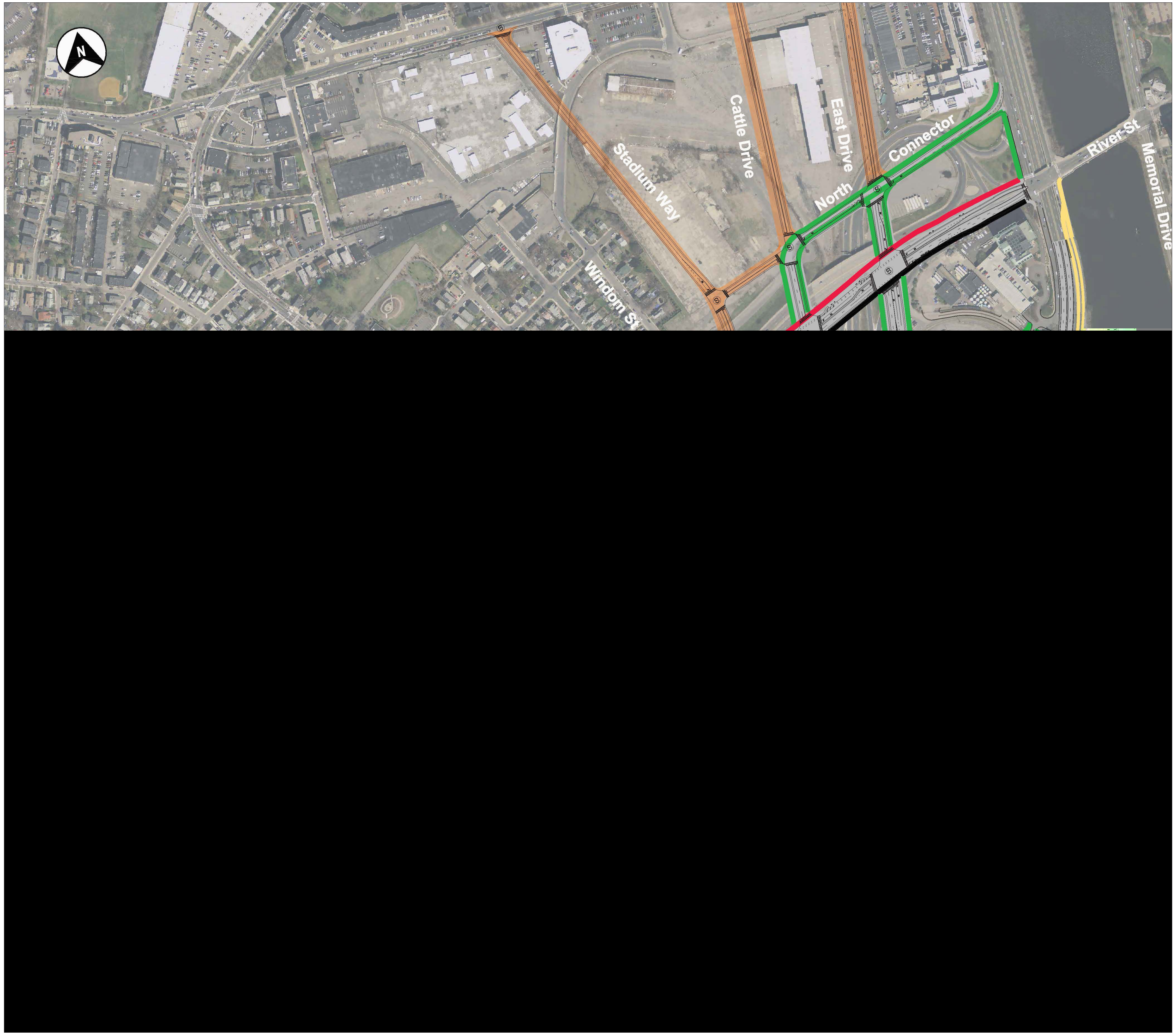
5.7.2.1 Highway and Streets

Bicycle accommodations in the Project Area that will be provided with the Preferred Urban Interchange Alternative include delineated markings within proposed network street shoulders, separated bicycle lanes on certain network streets, enhanced intersection geometry for safe bicycle crossings, and new connecting infrastructure. The pedestrian and bicycle accommodations within the Project Area are illustrated in Graphic 5.7-1.

The Project design will promote increased bicycle use in accordance with the 2015 *MassDOT Separated Bike Lane Planning and Design Guide* shown in Graphic 5.7-2. Separated bicycle lanes will offer safe separation from both vehicular and pedestrian traffic, which is needed to encourage the less experienced cyclists to travel more frequently by bicycle. See Graphics 5.73-A, 5.73-B and 5.7-4.

LEGEND

- ⬜ Proposed Roadway
- 🟥 Proposed Pedestrian Bridges
- 🟧 Proposed Roadway (By Others)
- ▬ One-Way Separated Bike Lanes Without Parking (6' Buffer)
- ▬ One-Way Separated Bike Lanes With Parking (6' Buffer)
- ▬ One-Way Separated Bike Lanes (1' Buffer)
- ▬ Two-Way Separated Bike Lanes (6' Buffer)
- ▬ On-Street Bike Lane with 8' Sidewalk
- ▬ No Ped and Bike Access (5' Shoulders)
- ▬ Dr. Paul Dudley White Path (Widened to 12' min. and separated pedestrian and bicycles within open space)


N
Stadium Way
Cattle Drive
East Drive
North
Connector
River St
Memorial Drive
Windom St

[redacted]

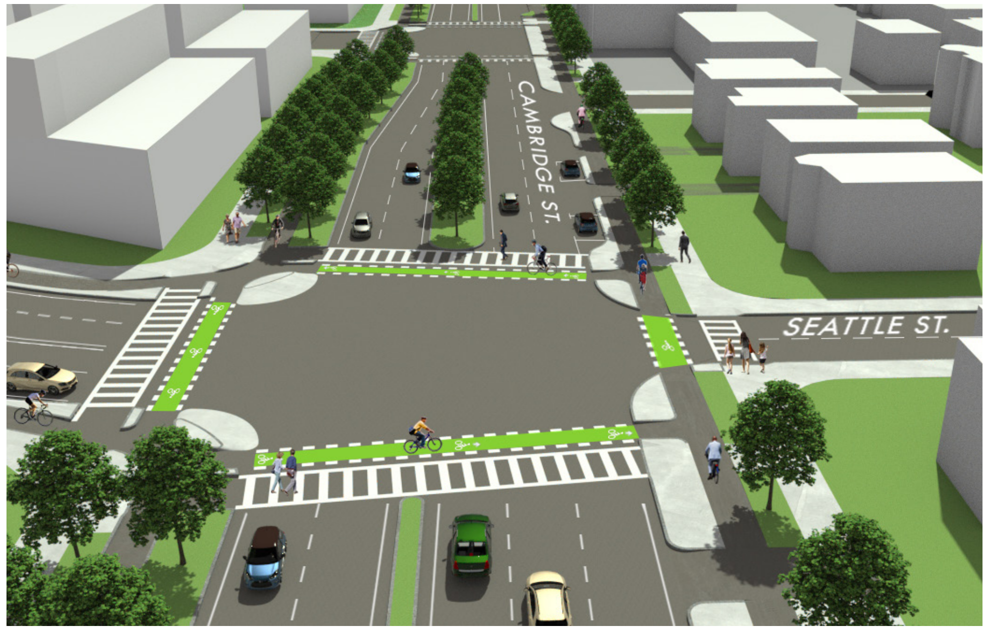
Graphic 5.7-1: Pedestrian and Bicycle Location Plan

SEPARATED BIKE LANE
PLANNING & DESIGN GUIDE 2015
MASSACHUSETTS DEPARTMENT OF TRANSPORTATION

Graphic 5.7-2: MassDOT Separated Bike Lane Planning and Design Guide 2015

The design will also provide a buffer strip, either planted or having a striated surface, between the sidewalk and bicycle lane. At intersections, the separation between pedestrians and cyclists will be further developed during final design, with pedestrians and cyclists each having their own crosswalk where the geometry is feasible. Where pedestrians must cross a bicycle lane, a pedestrian crosswalk marking will be proposed. A separating buffer strip will also be proposed between the bicycle lane and the travel lane.

Graphic 5.7-3A: Conceptual plan of separated bike lanes at Cambridge Street/Seattle Street Intersection

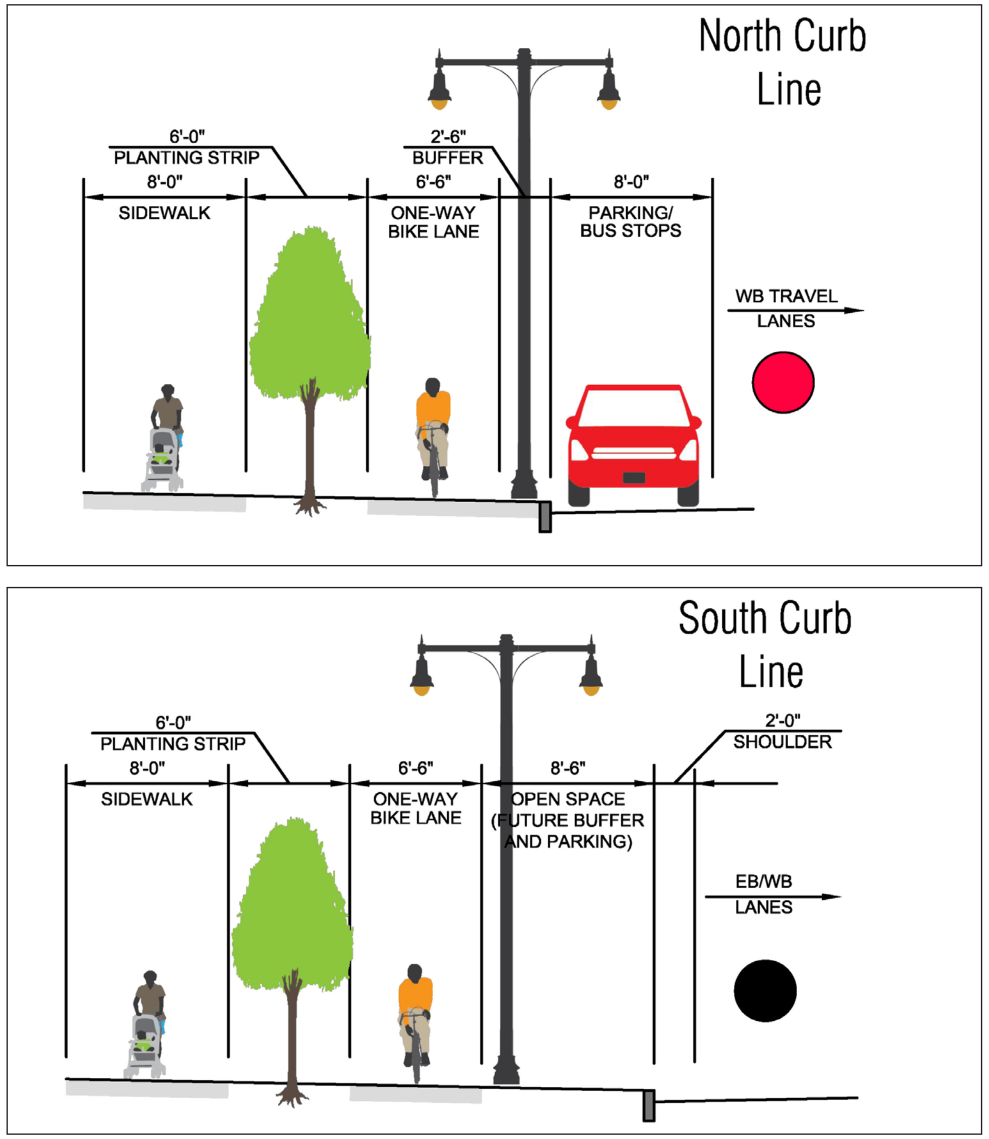


Graphic 5.7-3B: Conceptual perspective of separated bike lanes at Cambridge Street/Seattle Street Intersection

Pedestrian facilities will include new sidewalks in the proposed street network constructed in accordance with City of Boston requirements, and enhanced with landscape and streetscape amenities. Pedestrian crossings with appropriate traffic signal control will be proposed at all intersections. The Project will also include street level illumination for pedestrians.

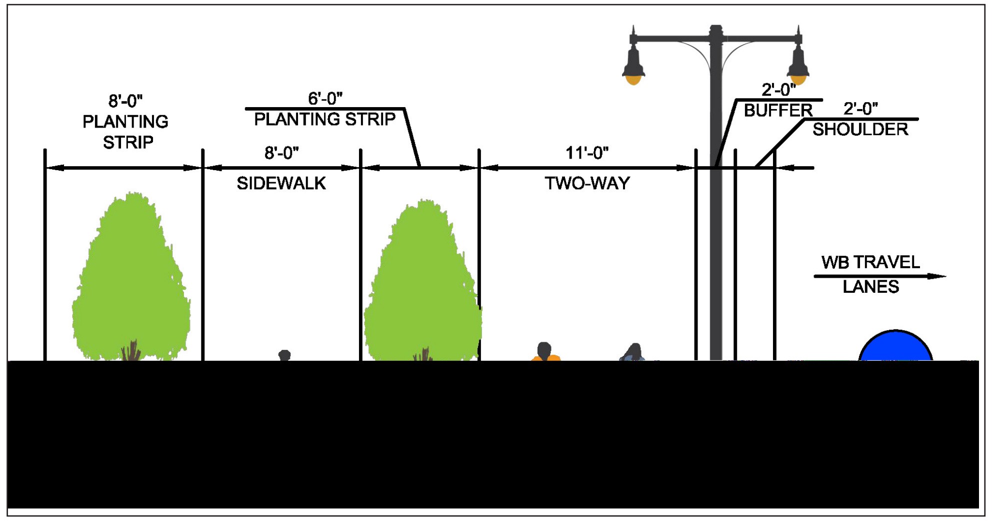
5.7.2.2 East-West Connections

The Project will include north-south and east-west connectivity routes that do not currently exist for both pedestrians and bicyclists. In addition, proposed improvements to Cambridge Street will enhance existing pedestrian and bicycle connectivity by adding a continuous sidewalk and one-way separated bike lane on both sides of the street between the Cambridge Street bridge and the SFR/River Street intersection.



Graphic 5.7-4: Cambridge Street pedestrian and bicycle typical sections (dot colors correspond with Pedestrian and Bicycle Location Plan, Graphic 5.7-1)

The I-90 Preferred Urban Interchange Alternative will address the vision and concerns voiced by many advocates of the so called “People’s Pike” by providing a direct bicycle and pedestrian connection from Allston to the PDW Path, with separated facilities for bicycles and pedestrians. The new east-west shared use path system on the north side of proposed Cambridge Street South will introduce a new direct connection from North Allston via North Harvard Street to the Charles River/PDW Path on a two-way separated bike path and sidewalk.

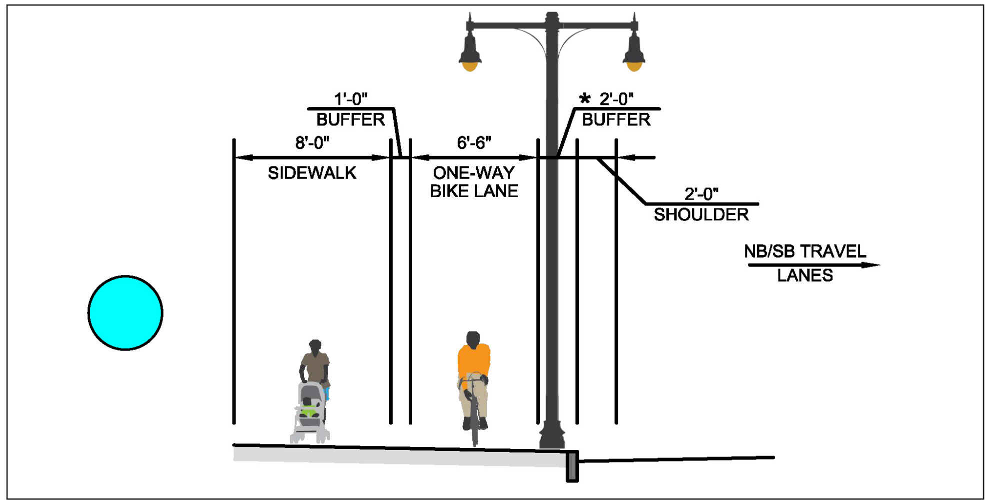


Graphic 5.7-5: Cambridge Street South pedestrian and bicycle typical section (dot color corresponds with Pedestrian and Bicycle Location Plan, Graphic 5.7-1)

The eastern end of Cambridge Street South will connect through to the Charles River Reservation/PDW Path as discussed in Section 5.4. SFR in this location will be constructed in a depressed section, below existing ground, enabling this new route to cross over SFR at ground level on a relatively flat slope to the PDW Path. The two-way bicycle facility and sidewalk will connect to the PDW Path in a plaza area with significant planted buffers on either side that will mitigate the noise from and views of, the adjacent roadways. See Graphic 5.7-5.

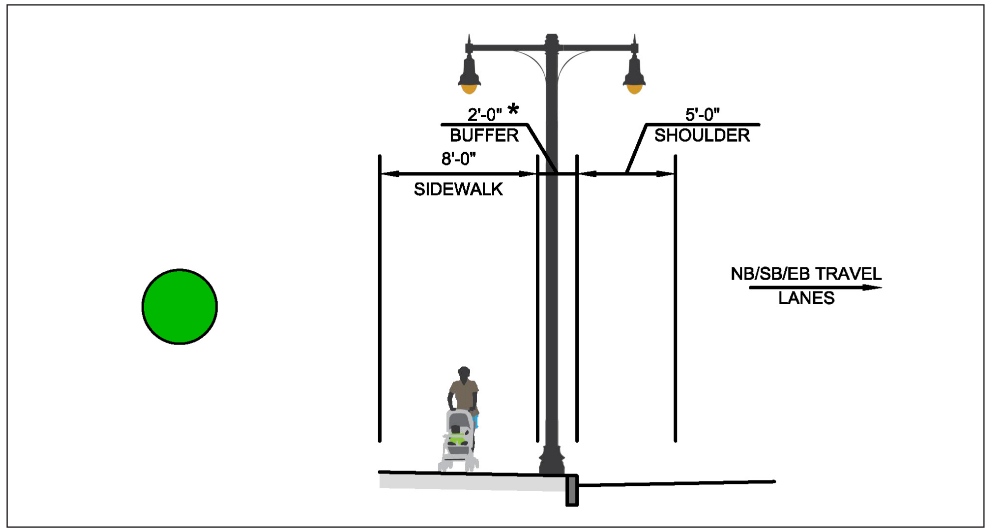
5.7.2.3 North-South Connections

The proposed Seattle Street Connector will add a new north-south pedestrian and bicycle connection between neighborhoods north of Cambridge Street in Allston to Commonwealth Avenue as it passes through and provides convenient access to the future West Station. See Section 5.7.2.5 and Graphic 5.7-9 for the location of Commonwealth Avenue to Malvern Street connection. A parallel route will include the Cattle Drive Connector, providing connectivity with the proposed Harvard development north of Cambridge Street to Babcock Street. See Graphic 5.7-6.



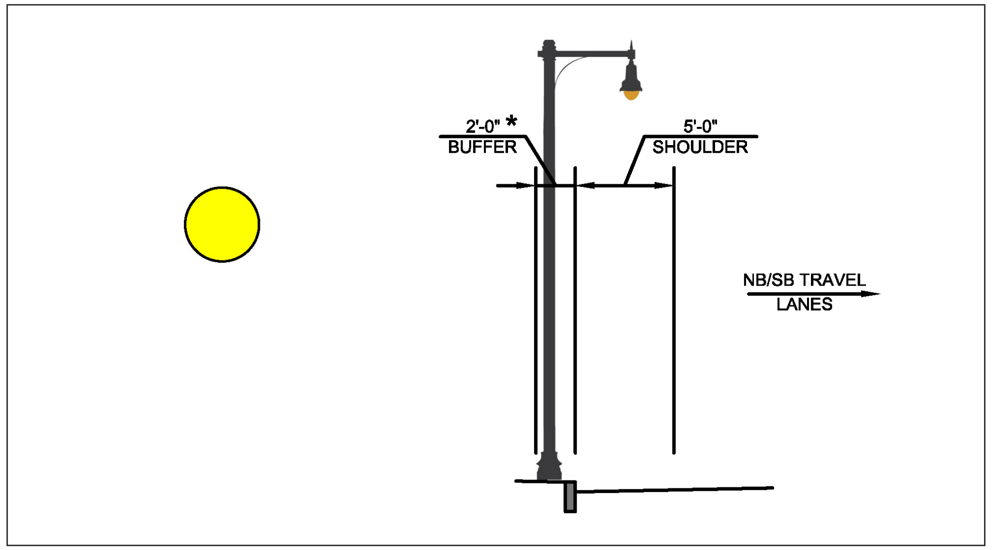
Graphic 5.7-6: Seattle Street and Cattle Drive Connector pedestrian and bicycle typical section (dot color corresponds with Pedestrian and Bicycle Location Plan, Graphic 5.7-1)

The proposed East Drive and West Connectors will also provide north-south pedestrian and bicycle connections between Cambridge Street and Cambridge Street South. See Graphic 5.7-7.



Graphic 5.7-7: East Drive and West Connector pedestrian and bicycle typical section (dot color corresponds with Pedestrian and Bicycle Location Plan, Graphic 5.7-1)

Other north/south connections associated with the I-90 off ramps will include the West Connector and East Drive connections between I-90 and Cambridge Street South. Since these connections are part of the highway off–ramp system, there are no provisions for pedestrian or bicycle accommodations to eliminate the possibility of pedestrians and bicyclists entering the highway environment. See Graphic 5.7-8.



Graphic 5.7-8: East Drive and West Drive Connector pedestrian and bicycle typical section (dot color corresponds with Pedestrian and Bicycle Location Plan, Graphic 5.7-1)

In the future, if Harvard elects to develop this area, they will apply to MassDOT or the City of Boston for permits or other approvals to construct curb cuts and associated bicycle and pedestrian access along select stretches of the roadways. The northern segment of these roadways, from Cambridge Street South to Cambridge Street, include on-street bike lanes with an 8-foot-wide sidewalk.

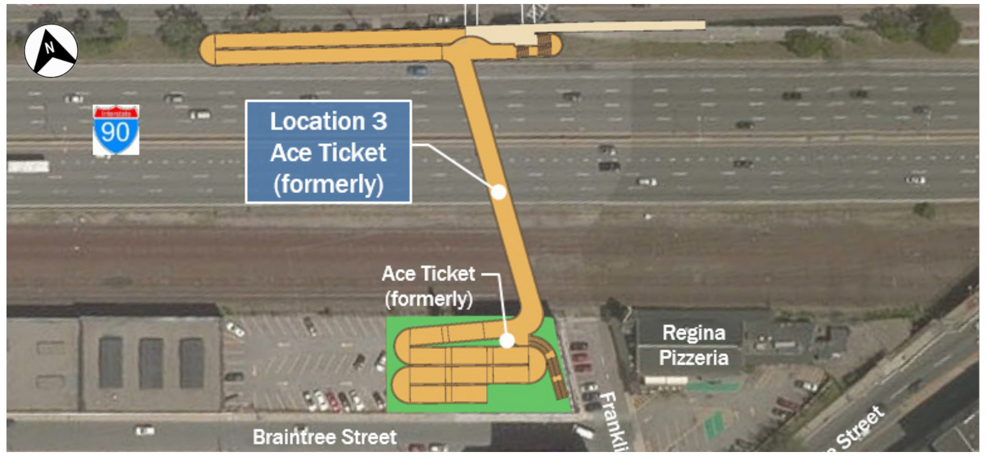
Aerial View of Franklin Street Pedestrian Bridge

5.7.2.4 Replacement/Relocation of the Franklin Street Bridge

The goal of the new pedestrian and bicycle bridge is not only to comply with ADA requirements, but to also create a direct connection between the commercial districts along Harvard Street to the residential neighborhood in North Allston. This bridge will reconnect the two areas of Allston that have been severed by the rail lines and I-90. It will provide a placemaking opportunity in the neighborhood, in keeping with the overall goal of the Project. Of the three alternatives considered in Section 3.1.3, the former Ace Ticket building Location 3 was determined to be the best location because it will most closely conform to the Franklin Street desire line and also provide the most direct visual and physical connection across I-90. A bridge located directly along the center line of Franklin Street was considered, but major utilities running under the railroad tracks and I-90 severely restrict the space available for new bridge foundations.

The stub of Franklin Street between Braintree Street and the railroad ROW is privately owned and, with the former Ace Ticket Building gone, has the potential to be incorporated into a larger vision for redevelopment of the adjacent properties. A bridge in this alignment will attract some of the pedestrian and bicycle activity currently using Cambridge Street and likely increase pedestrian traffic on the western side of Harvard Avenue at the intersection with Cambridge Street.

While the bridge and ramps will require the demolition of the former Ace Ticket building and the relocation of the billboard, the remainder of the Braintree Street property will remain as a single parcel, simplifying future redevelopment. The long ramp required will also impact the parking lot on the west side of the former Ace Ticket building. Construction of the ramp will require removal of approximately 25 of the 47 parking spaces.

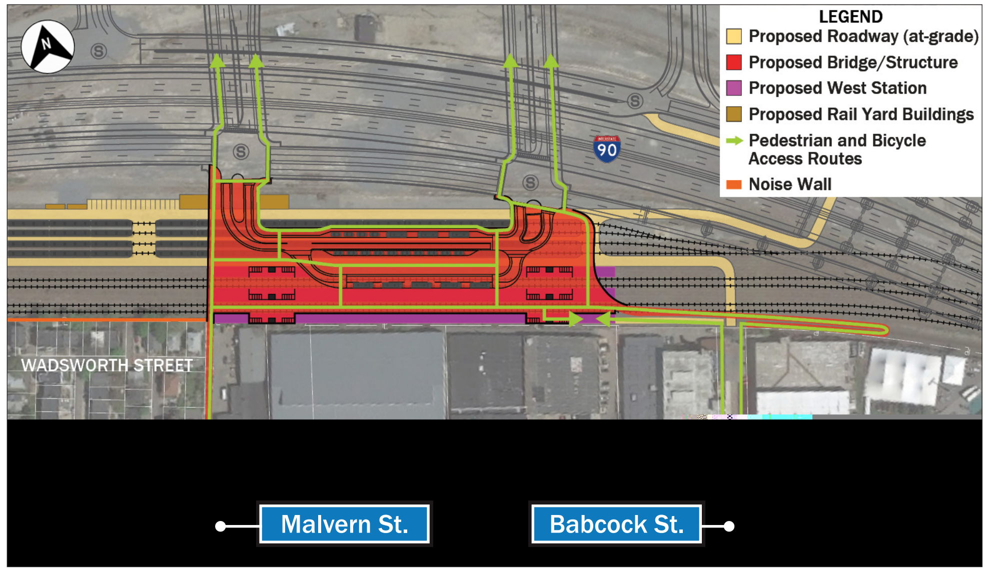


Location 3 Alternative Pedestrian Bridge Replacement

5.7.2.5 Bridge Connecting Malvern Street with the Seattle Street Connector

As discussed in Section 5.3, a 12-foot-wide bicycle and pedestrian bridge will be constructed to connect Malvern Street to the south with the proposed street network to the north across the Worcester Main Line, rail yard and realigned I-90. This bridge will be located at the northern end of Malvern Street, providing a connection between Commonwealth Avenue and Cambridge Street, and connecting two neighborhoods that have been separated by the railroad yard and the I-90 interchange. With eventual access to West Station also being provided from this new link, it will serve as a major pedestrian and bicycle corridor. The Malvern Street bridge will meet standards set forth in the Americans with Disabilities Act of 1990, and will be designed so that cyclists will not need to dismount to use the bridge. This bridge will provide a much desired north/south pedestrian connection from the Allston neighborhood in the south to points north, notably to the areas adjacent to the Charles River.

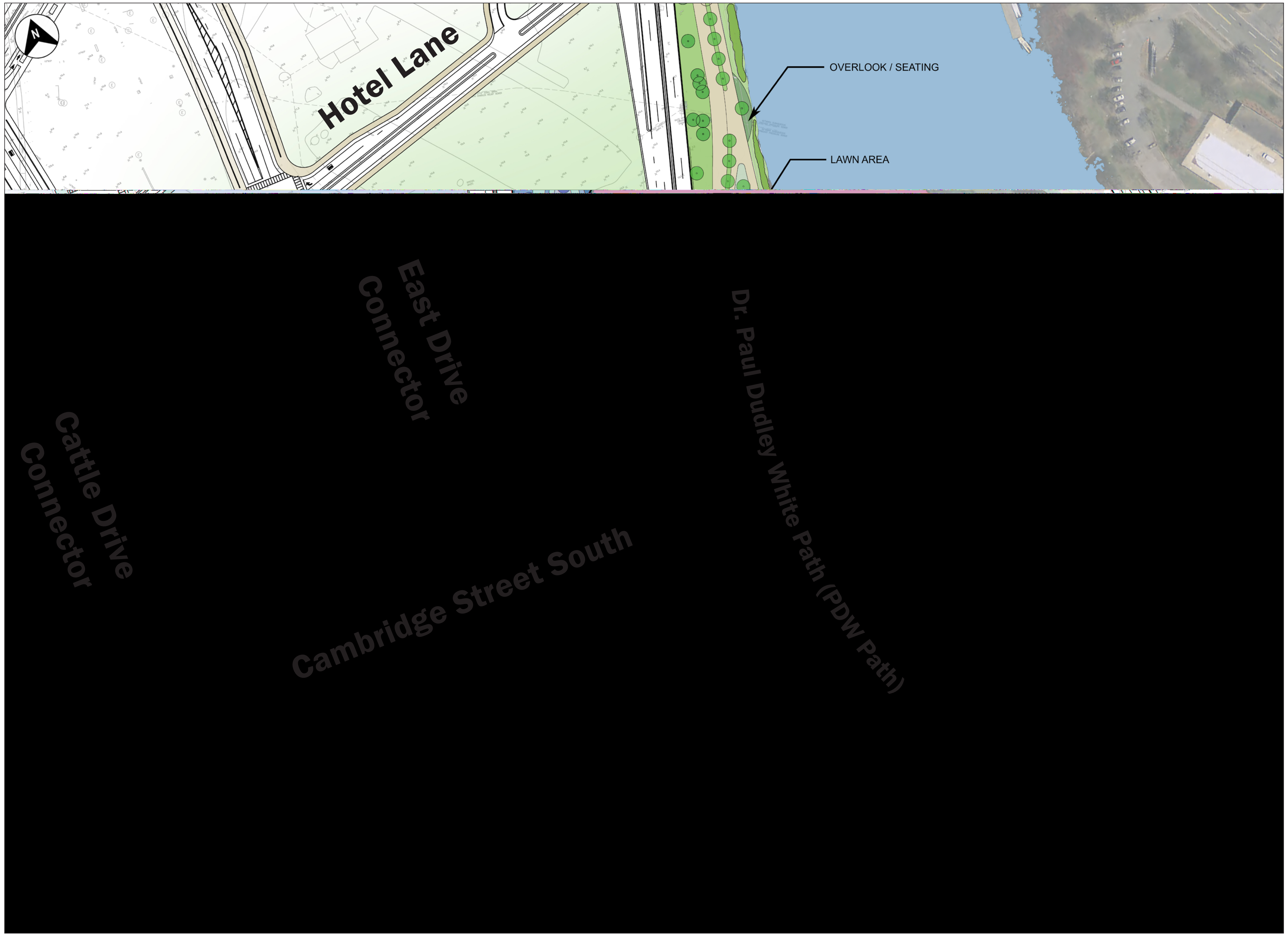
The Malvern Street connection, as shown in Graphic 5.7-9, is located partially on private property that is currently used as a parking access alley and parking area. Partial property acquisition of a strip of land approximately 15 feet in width will be required to construct this connection.


LEGEND
🟨 Proposed Roadway (at-grade)
🟥 Proposed Bridge/Structure
🟪 Proposed West Station
🟫 Proposed Rail Yard Buildings
→ Pedestrian and Bicycle Access Routes
🟧 Noise Wall
90
WADSWORTH STREET
Malvern St.
Babcock St.

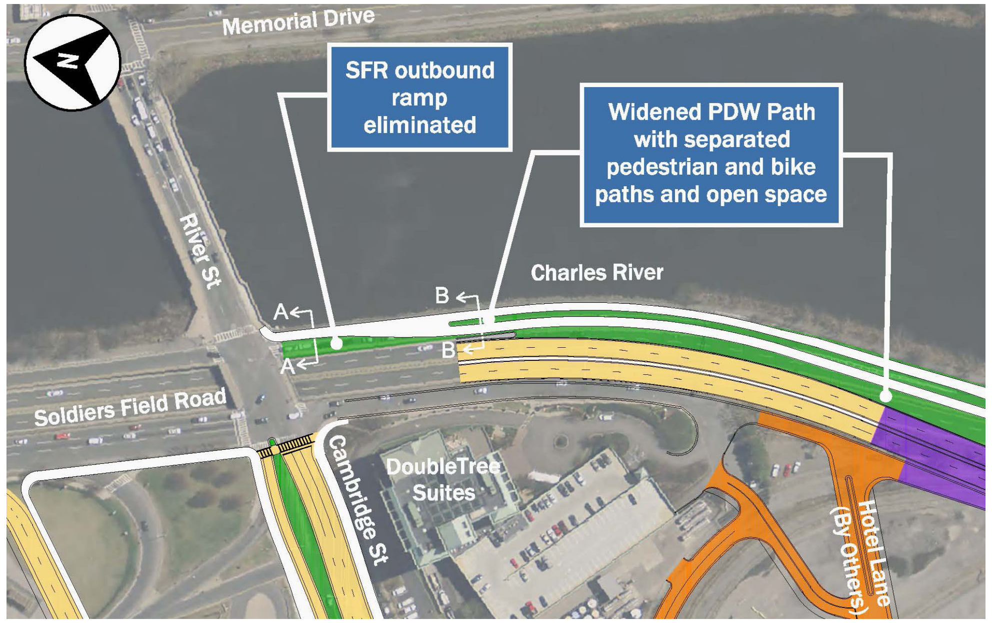
Graphic 5.7-9: Malvern Street and Babcock Street pedestrian bridge locations

5.7.2.6 PDW Path

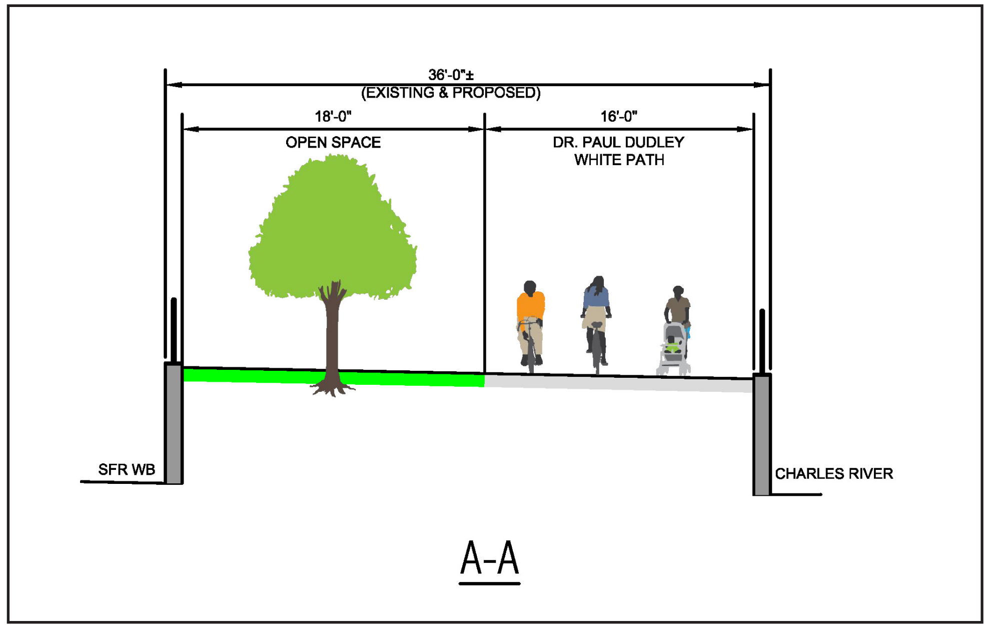
The section of PDW path from the western end of the Throat Area to the River Street Bridge will be greatly improved by relocating SFR west, away from the Charles River. This will allow for a wider path from 8.5 feet wide to 12 feet wide, but more significantly, it will allow for expanded parkland along the river, connecting to the eastern end of Cambridge Street South. For the I-90 Urban Interchange Preferred Alternative, the existing SFR outbound exit ramp to River Street will be discontinued as a vehicular travel way and converted to a pedestrian and bicycle facility integrated with the created open space. The removal of the vehicular ramp to Cambridge Street/ River Street and its replacement with separated bicycle and pedestrian paths will alleviate the navigation of a very difficult section of the bike path (the Narrows) and create a safer and stronger connection to River Street and Magazine Beach, and to new walking and bicycling facilities along Cambridge Street. See Graphic 5.7-10 through 5.7-13.


Hotel Lane
OVERLOOK / SEATING
LAWN AREA
East Drive Connector
Dr. Paul Dudley White Path (PDW Path)
Cattle Drive Connector
Cambridge Street South

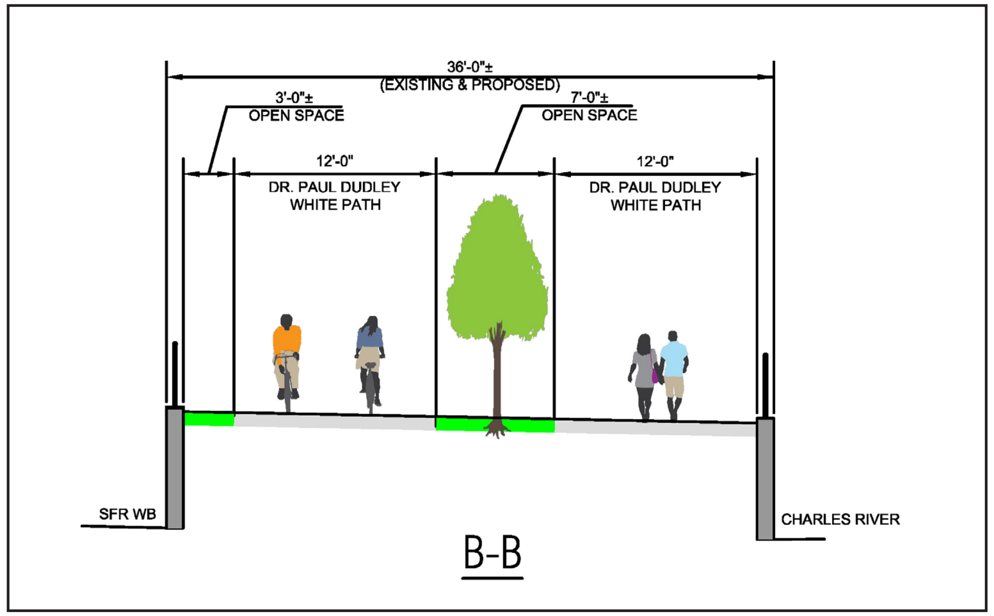
Graphic 5.7-10: Conceptual PDW Path with Open Space at Cambridge Street South


Memorial Drive
SFR outbound ramp eliminated
Widened PDW Path with separated pedestrian and bike paths and open space
River St
Charles River
A
A
B
B
Soldiers Field Road
Cambridge St
DoubleTree Suites
Hotel Lane (By Others)

Graphic 5.7-11: Conceptual PDW Path with Open Space at the Narrows


36'-0"±
(EXISTING & PROPOSED)
18'-0"
OPEN SPACE
16'-0"
DR. PAUL DUDLEY WHITE PATH
SFR WB
CHARLES RIVER
A-A

Graphic 5.7-12A: Cross Section A-A PDW Path at the Narrows


36'-0"±
(EXISTING & PROPOSED)
3'-0"±
OPEN SPACE
7'-0"±
OPEN SPACE
12'-0"
DR. PAUL DUDLEY WHITE PATH
12'-0"
DR. PAUL DUDLEY WHITE PATH
SFR WB
CHARLES RIVER
B-B

Graphic 5.7-12B: Cross Section B-B PDW Path at the Narrows

Graphic 5.7-13: Conceptual Rendering of Separated Pedestrian and Bike Paths at the Narrows

5.7.3 2040 Design Year

By the 2040 Design Year, the proposed West Station will be constructed as a multi-modal station serving pedestrians, cyclists, private vehicles (kiss and ride), taxis, buses and commuter trains. MassDOT anticipates the station will primarily serve residents in neighborhoods within a 0.25 to 0.5 mile walking radius. Bicycle and pedestrian access to the station from the south will be provided through a modified Malvern Street bridge and a new ramp/bridge system access way from Babcock Street.

5.7.3.1 Modification of Malvern Street Bridge to Provide Access to West Station

The Malvern Street bridge will maintain the original alignment, but connect to the bus loop level of the proposed station. The retained alignment will allow cyclists and pedestrians to use the bridge to cross the Worcester Main Line, rail yard and I-90 at any time of day without needing to enter the station area. Bicycle and pedestrian access to the station from the north will be provided through the sidewalk and roadway network connections for the bus loop. See Graphic 5.7-14.

5.7.3.2 New Bridge at Babcock Street Connecting to Points North and West Station Access

The northern end of Babcock Street, as it approaches the rail yard, drops to an elevation roughly level with the rail corridor. A ramp will be required for pedestrians and bicyclists to access West Station or destinations beyond. The bridge will include a switchback, running east-west then crossing up and over the rail yard until it meets Cattle Drive. This bridge will provide an important connection from Commonwealth Avenue and the BU West campus to the neighborhoods north of I-90. Construction of this connection will include minor aesthetic and functional enhancements to the sidewalk at the end of Babcock Street, a private way owned by BU north of Ashford Street. Construction elsewhere in the neighborhood will largely be avoided.

The Babcock Street pedestrian and bicycle connection will provide access to the station with minimal interruption of existing uses and buildings in the neighborhood to the south. See Graphic 5.7-14.

The Station and Rail Yard Alternatives Analysis Technical Appendix (Appendix A) reviews the various considerations in developing the pedestrian and bicycle connections to the station. The considerations included pedestrian sidewalk and bicycle lane widths, existing sidewalk conditions on neighborhood streets to the south, existing bicycle lanes on Cambridge Street and other streets, potential property acquisitions, access way grade changes, visual connections to Commonwealth Avenue to the south, and the potential for pedestrians and cyclists to use the station for “thru-access” across the rail yard, Worcester Main Line and I-90.

5.7.4 Throat Area Variations

For all three Throat Area Variations, bicycle and pedestrian access will be provided on the PDW Path between the GJR Bridge and the Cambridge Street intersection. The path width will be increased from an average of 8.5 feet to 12 feet for the 3K-HV and 3K-AMP Variations. For the 3K-ABC, the path width will be 8.5 feet, which matches the existing width. The path will be reconstructed to provide separated pedestrian and bicycle paths, where feasible, depending on the width of the created open space. For all three Throat Area Variations, the existing SFR outbound (westbound) exit ramp to Cambridge Street will be discontinued as a vehicular travel way and converted to a pedestrian and bicycle facility integrated with the created open space.

3K- HV Variation

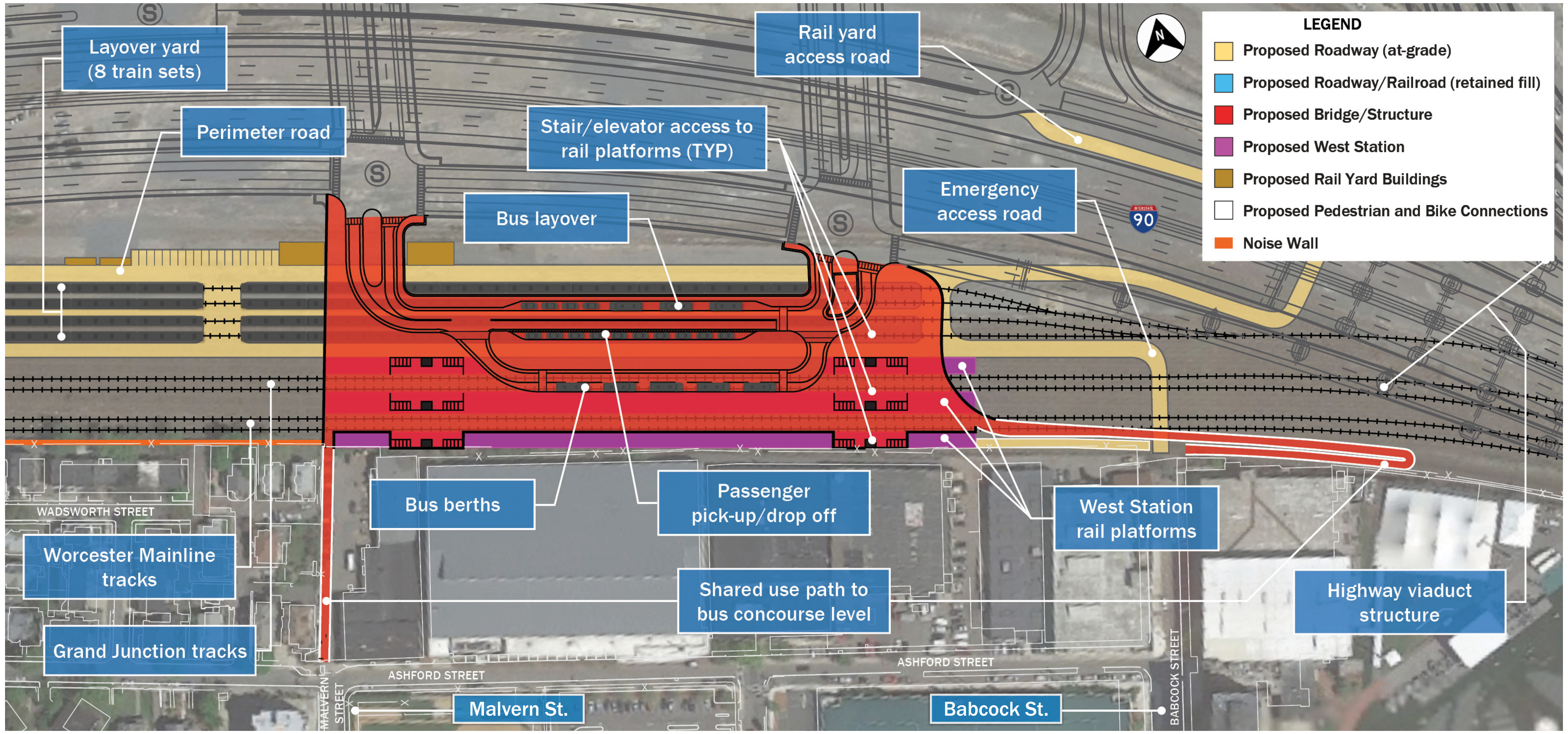
Bicycle and pedestrian movement through the 3K-HV Variation is provided by the PDW Path which will be widened from its existing 8.5 foot width to a 12 foot width. The alignment of the path will remain relatively unchanged from the existing location, offset from the top of existing slope on the southerly bank of the Charles River and adjacent to SFR, separated from the road by a minimum 6-foot-wide green space and a guardrail. No barriers are proposed directly adjacent on either side of the path resulting in an effective operating width of 12 feet. This alignment offers the opportunity for landscaping and shade tree preservation. The surface of the path will remain paved, and areas disturbed by construction will be restored with seeding and landscaping. Sufficient space is available at the eastern limit of the Throat Area to construct an ADA/AAB compliant ramp from the PDW Path to a potential GJR path connection between the northerly abutment of the railroad bridge over SFR and the southerly abutment of the railroad bridge over the Charles River. At present, no bicycle or pedestrian facilities exist on these structures; reconstruction to safely accommodate them is outside of the scope of the Project.

3K-AMP Variation

The 3K-AMP Variation offers two bicycle and pedestrian routes through the Throat Area. One route is the PDW Path, similar to the 3K-HV Variation, while an additional route is proposed on the GJR structure. The alignment of the path will also remain relatively unchanged from the existing location. The paved path will be widened from the existing 8.5 feet to 12 feet. Similar to 3K- HV, the path will be offset from the top of the existing slope, along the Charles River and adjacent to SFR, and separated from the road by a guardrail with additional offset. No barriers are proposed directly adjacent on either side of the path resulting in an effective operating width of 12 feet. Additional offset will be available to accommodate landscaping or green space between SFR and the PDW Path east and west of the 200-foot-long narrowest section of the Throat Area. Similar to both the 3K-HV and 3K-ABC Variations, sufficient space is available at the eastern limit of the Throat Area to construct an ADA/AAB compliant ramp from the PDW Path to a potential GJR path connection between the northerly abutment of the railroad bridge over SFR and the southerly abutment of the railroad bridge over the Charles River. Similar to the 3K-HV Variation, reconstruction to safely accommodate them is outside of the scope of the Project.

The additional pedestrian and bicycle route that this variation offers is made possible by the proposed GJR structure that spans over the I-90 at-grade section, providing a bicycle and pedestrian shared use path approximately 12 feet wide and 2,800 feet (approximately 0.5 miles) in length along the elevated railroad viaduct through the Throat Area. The shared use path will connect to the bus loop level of the proposed station, run along the elevated railroad viaduct structure through the Throat Area, and connect to the PDW Path along the Charles River.

The route will begin in the west at a junction with the proposed Babcock Street bicycle and pedestrian ramp to West Station. It will continue east on the GJR structure to a proposed retained section between proposed at-grade I-90 and SFR, then continue on another proposed widened bridge over SFR, ending just south of the existing railroad bridge over the Charles River. The route is independent of the GJR structure between the Babcock Street connection and Harry Agganis Way, but east of Harry Agganis Way, the path will be on the southerly side of the elevated rail structure, located offset from the BU property line by the two commuter rail lines, a distance of approximately 31 feet. The entire bicycle and pedestrian route will be 12 feet wide with fence and barrier on each side. The portion of the path on the GJR structure will be isolated from view due to its elevated location and offset from the BU property. The route will end in the east at a proposed ADA/AAB ramp connection to the PDW Path west of the BU Bridge.


Layover yard (8 train sets)
Perimeter road
Rail yard access road
Stair/elevator access to rail platforms (TYP)
Bus layover
Emergency access road
90
LEGEND
Proposed Roadway (at-grade)
Proposed Roadway/Railroad (retained fill)
Proposed Bridge/Structure
Proposed West Station
Proposed Rail Yard Buildings
Proposed Pedestrian and Bike Connections
Noise Wall
WADSWORTH STREET
Worcester Mainline tracks
Grand Junction tracks
Bus berths
Passenger pick-up/drop off
West Station rail platforms
Shared use path to bus concourse level
Highway viaduct structure
ASHFORD STREET
ASHFORD STREET
MALVERN STREET
BABCOCK STREET
Malvern St.
Babcock St.

Graphic 5.7-14: Malvern Street and Babcock Street pedestrian bridge locations at West Station

As the design advances, MassDOT may add an additional point of access to the shared use path from Harry Agganis Way within the BU campus. The stretch of the shared use path between Harry Agganis Way and the PDW Path will have no additional access or exit points.

3K-ABC Variation

The PDW Path provides bicycle and pedestrian access through the Throat Area, but with the 3K-ABC Variation, the wider at-grade alignment requires the path to be located further northeast. Subsequently, a portion of the PDW Path must be located within the resources areas of the Charles River, supported by a retaining wall.

To minimize further encroachment into the Charles River, the 3K-ABC Variation limits the width of the PDW Path to 8.5 feet for a distance of approximately 500 feet, resulting in an effective operating path width of 4.5 feet when the 2-foot safety offsets measured from the barriers/railings on each side are deducted. A safety offset is the minimum distance recommended by bicycle and pedestrian facility planners measured between the paved operating area of the path surface and any vertical obstruction, such as a fence, railing or barrier. The offset, also called the "shy distance", is considered unusable and outside the operating section of the path. Additional offset will be available to accommodate landscaping or green space between SFR and the PDW Path east and west of the 1,000-foot-long narrowest section of the Throat Area. In comparison, the 3K-HV and 3K-AMP Variations provide the 12 foot desirable width for facilities where there will be a high volume of pedestrians and bicyclists in accordance with AASHTO's *Guide for the Development of Bicycle Facilities* (2012).

Similar to 3K-HV and 3K-AMP, sufficient space is available at the eastern limit of the Throat Area to construct an ADA/AAB compliant ramp from the PDW Path to a potential GJR path connection between the northerly abutment of the railroad bridge over SFR and the southerly abutment of the railroad bridge over the Charles River. However, reconstruction to safely accommodate the ramp is beyond the scope of the Project.

Both the 3K-AMP and 3K-ABC Variations include further realigning of SFR to create additional open space along the Charles River and a new PDW Path connection. The new PDW Path connection will connect the path on the east side of the BU Bridge to the path on the west side of the GJR Bridge along a straight alignment greatly improving accessibility for bicyclists. This is feasible only as a consequence of the required reconstruction of the GJR Bridge over SFR. This connection will be in addition to the existing portion of path that runs along the outside of the bridge abutments over the Charles River that is difficult for bicyclists to navigate. The 3K-HV Variation does not require the GJR Bridge to be reconstructed and therefore does not include the new PDW Path in this area. However, providing the new PDW Path is not precluded from occurring in the future for the 3K-HV Variation.

5.8 Highway and Streets Safety and Operations

5.8.1 Safety/Operations

This section examines highway safety operations within the interchange and compares the operations and safety of the three Throat Area Variations. In general, safety features outside of the Throat Area were optimized through the refinements of Alternative 3J to 3K, and the variations were further developed through the Task Force.

Ensuring driver safety and future vehicular operations are critically important elements of the Project because, as was discussed previously, I-90 is one of the busiest highways in the Commonwealth serving approximately 154,000 users per day. Based on CTPS estimates, future average daily traffic (ADT) will be 158,000 in 2025 and 160,000 in 2040.

Due to its strategic location within the metropolitan region's urban core, the Allston ramps are also busy, serving approximately 65,000 to 70,000 vehicles per day. The highway is also critical to commerce within the region and the state, as over 8,000 trucks per day use I-90.

5.8.1.1 Safety/Operations within the Interchange

I-90 and Ramps

Within the limits of the interchange, from the ends of the westerly ramps to the ends of the easterly ramps at the westerly end of the Throat Area, I-90 will meet all interstate highway design standards as required by the FHWA and as presented in the AASHTO publication, *A Policy on Design Standards Interstate System*, dated January 2005, with the exception of left shoulder width.

To the west, between the Project limit and the westerly ramp ends, the I-90 geometry will transition to meet the existing highway geometry. Within the interchange, the required 12-foot-wide travel lanes and full-width right shoulders (10 feet plus 2 foot offset to the shoulder barriers) will be provided. A minimum 4-foot-wide left shoulder with 2-foot-wide offsets adjacent to the median barrier will also be provided. AASHTO requires 12-foot-wide right and left shoulders on facilities with truck traffic volumes exceeding 250 Directional Design Hourly Volume (DDHV). The I-90 truck volume will exceed 250 DDHV within the Project limits, but the recommended left shoulder widths will not be provided because the distance between the existing westerly highway section and the Throat Area is too short to both transition to and from the recommended width and to hold the recommended section width for a practical length. The I-90 horizontal alignment and profile will meet AASHTO standards.

Ramp geometry (clearances, widths, sight distances), including acceleration and deceleration lengths, will meet AASHTO interstate design standards. In addition, the eastbound and westbound exit ramps to the interchange will include exit only lanes that enhance safety by separating decision-making maneuvers and speed reduction from interstate traffic in advance of the deceleration lanes. With the exit only lanes, speed variability – a significant interstate safety issue and a contributing factor in crash frequency – will be removed from the through travel lanes.

Vertical clearances between the interstate pavement and the underside of the proposed overpass bridges will meet the AASHTO minimum 14-6". Increasing the vertical clearance is not required by AASHTO and raises the height of the bridges. This would be detrimental to the Project goal of promoting increased pedestrian and bicycle travel through the street grid. Travel routes with less elevation differences are more attractive and usable compared to routes with steeper grades or elevation differences.

The proposed interstate design will meet the overriding dominant safety objective of presenting consistent geometric highway characteristics while increasing safety features to the maximum extent, where possible.

Street Grid Network

The street grid within the City of Boston jurisdiction will meet City of Boston and MassDOT design requirements for Complete Streets. Bicycle, pedestrian and vehicular travel modes are equally regarded in the street grid design. Eleven-foot-wide travel lanes will meet the minimum urban travel needs, accounting for truck traffic. Five-foot-wide shoulders will be provided for bicycle lanes in locations where separated bicycle lanes are not provided, as described in Section 5.7.2. Separated bicycle lanes will offer increased safety for those uncomfortable bicycling adjacent to vehicles, and 8-foot-wide sidewalks will meet the Boston standard design. In addition, pedestrian refuge islands will be provided where appropriate and the proposed separation of travel modes at all signalized intersections will present the highest standard of safety.

5.8.1.2 Safety/Operations in the Throat Area

Crash data for the most recent available three-year period (2013-2015) indicates the I-90 viaduct has an average crash rate of 1.08 crashes per million vehicles miles traveled (MVMT), which exceeds the statewide average for urban interstates of 0.58 crashes per MVMT. Given this 86% exceedance over the statewide average, safety and operational improvements are warranted. MassDOT's goal is to provide these improvements on this critical section of interstate in a manner that provides more reliable operations and helps reduce injury/fatal crashes, like the fatal crash that occurred on the viaduct in March of 2015. In this incident, a secondary crash occurred when two vehicles pulled over into the right travel lane to exchange information about their sideswipe crash. The vehicles were rear-ended by a third vehicle, resulting in the fatality. The following review of the Throat Area Variations looks at the specific safety and operational characteristics for each variation with a comparative summary at the end.

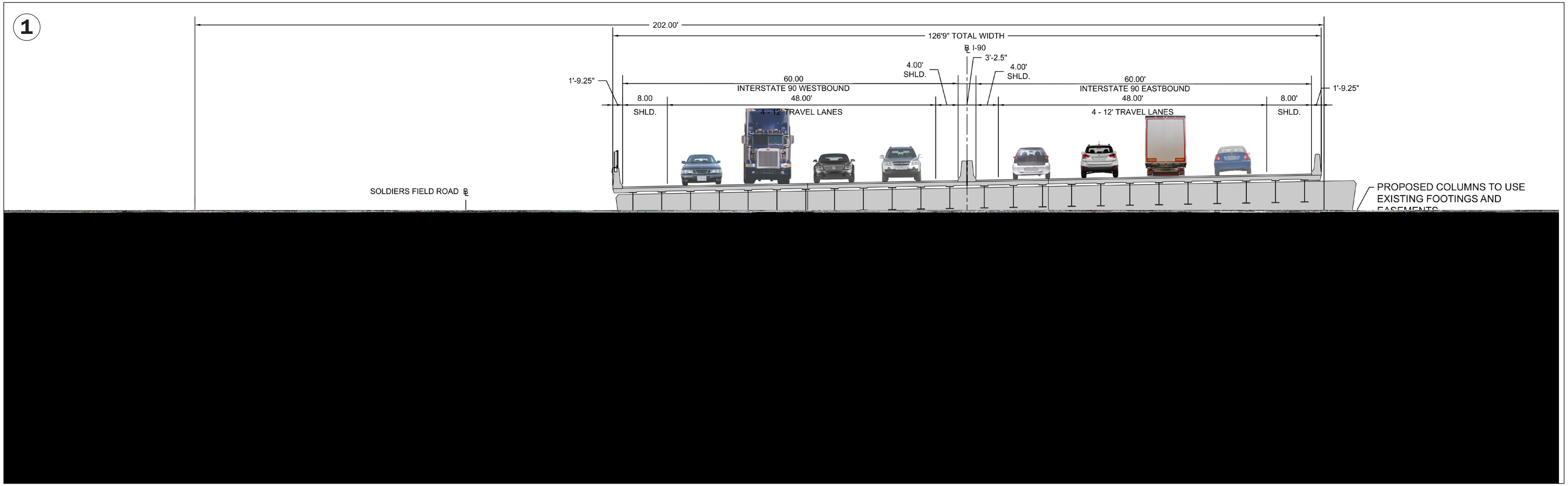
As Table 5.8-1 summarizes, in comparison to 3K-HV, the 3K-AMP and 3K-ABC Variations fall short on almost all engineering guiding criteria crucial to public safety.

Table 5.8-1: Comparison of Safety/Design Features for the Throat Area Variations

	Throat Area Variation		
I-90 Safety Features/Design Compliance	**3K-HV**	**3K-AMP**	**3K-ABC**
Complies with AASHTO and FHWA recommended interstate cross section widths*	✓		
Provides usable outside shoulder for breakdowns and first responders	✓		
Provides shoulder widths that avoid stormwater ponding in travel lanes	✓		
Complies with AASHTO horizontal and vertical geometry standards	✓	✓	✓
Reduces curvature of horizontal alignment		✓	✓
Provides width for vehicle recovery/crash avoidance	✓		
Provides shoulder accommodation for snow storage	✓		
Provides shoulder width flexibility for short- and long-term maintenance	✓		

✓ = complies

* *Source: A Policy on Design Standards, Interstate System, January 2005, AASHTO*



3K-HV Cross Section, Looking East (Location of narrowest section of Throat Area)

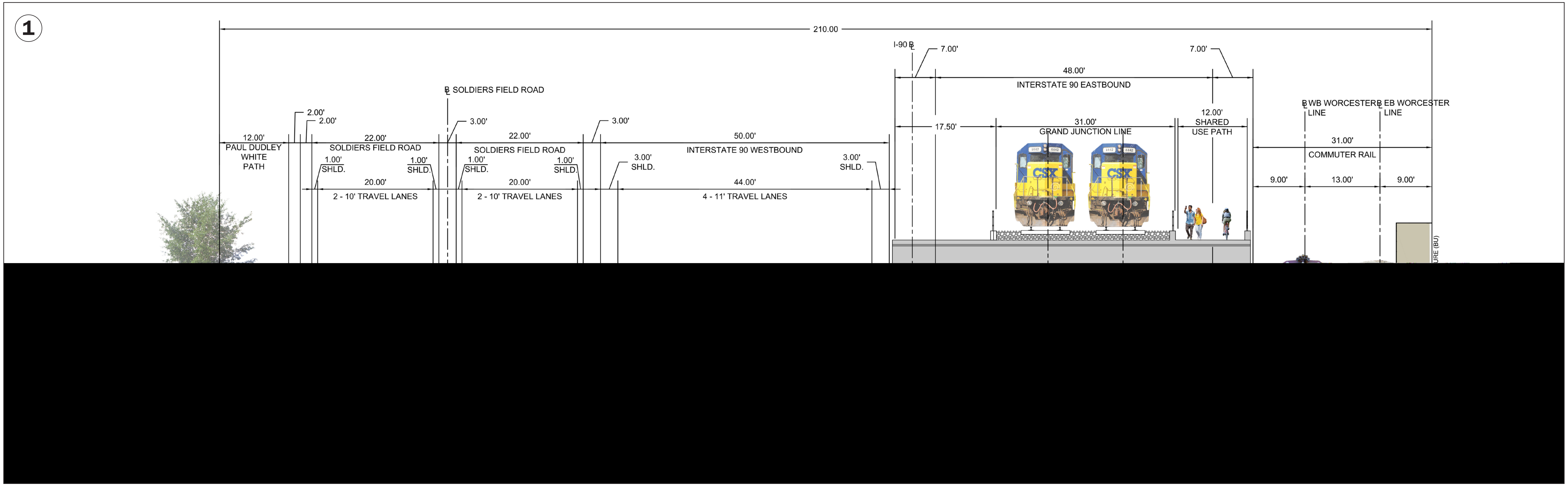
Variation 3K-HV

Variation 3K-HV will exceed the minimum interstate cross-sectional design requirements for long bridges as required by AASHTO and as adopted by MassDOT. A long bridge, defined under AASHTO's 2005 publication, A Policy on Design Standards Interstate System, is a structure greater than 200 feet in length. The resulting shoulder width requirements under this criteria are less narrow than those under AASHTO's minimum for at-grade interstate designs, which call for 12-foot-wide left and right shoulders where high truck volumes exist. The proposed 12-foot-wide travel lanes, 4-foot-wide left shoulders, and 8-foot-wide right shoulders under 3K-HV will exceed AASHTO's long bridge minimum design requirements. These requirements stipulate that the bridge deck must include 4-foot-wide left and right offsets between bridge parapets and travel lanes. By constructing the additional 4 feet beyond the minimum 4-foot offset on the right side, the Project will furnish several important safety and operational benefits not provided by the 3K-AMP or 3K-ABC Variations:

- A usable, safe, 8-foot-wide shoulder for breakdown refuge and first responders
- Stormwater collection in the shoulder to prevent ponding water and ice hazards that encroach into the adjacent travel lane
- Sufficient width for maintenance vehicles and crews to limit lane closure to a maximum of one lane (versus two) for all maintenance activities
- Sufficient width for snow storage and clearance of travel lanes
- An increase in available width for vehicle recovery and crash avoidance potential for distracted drivers and deck debris incidences

To transition from the existing I-90 alignment at the easterly Project limit to the proposed highway location in the Throat Area, the horizontal alignment will replicate the existing condition. It will include a 2,000-foot radius curve to the left, followed by a 2,000-foot radius curve to the right, with both curves sloped at a 3% cross slope. At this location, the Worcester Main Line tracks will be to the south of I-90 as I-90 rises in elevation to the viaduct. The curved alignment is needed to transition the I-90 horizontal position from a location adjacent to the tracks to a location over the tracks. The remainder of the I-90 alignment in the Throat Area will be straight.

The I-90 profile will rise at just under the maximum AASHTO urban highway gradient of 4% at the easterly Project limit to enable the Worcester Main Line tracks to pass beneath the highway structure. Beyond that point, the profile gradient will reduce to 1% for the remainder of the Throat Area. AASHTO's critical length of grade for a constant 4% gradient is 1,200 feet. Critical length of grade is the distance beyond which the speed of a loaded truck reduces significantly enough that the variable speeds between truck traffic and the other adjacent vehicles reduces operating safety. The length of 4% gradient proposed on I-90 is significantly less than 1,200 feet and consequently, the proposed profile gradient will result in no reduction in operating safety.



3K-AMP Cross Section, Looking East (Location of narrowest section of Throat Area)

Variation 3K-AMP

Variation 3K-AMP will not satisfy the minimum AASHTO cross-sectional design requirements for at-grade interstate highways. The proposed 11-foot-wide travel lanes and 2-foot-wide left and right shoulders for I-90 eastbound, and 3-foot-wide left and right for I-90 westbound, will not meet AASHTO's minimum at-grade interstate design requirements of 12-foot-wide travel lanes and 12-foot-wide left and right shoulders for high truck volume. The substandard travel lane and shoulder widths are proposed to create a narrow-width at grade facility. However, the safety, maintenance and operational benefits of the 12-foot-wide travel lanes and 8-foot-wide usable shoulders under the 3K-HV alternative will not be possible with 3K-AMP.

The proposed at-grade section will provide no shoulders or other reserved space between SFR and the interstate for snow storage. It also will not provide adequate shoulder width to safely contain stormwater flow. This will result in gutter flow spreading into the adjacent travel way, leading to the potential for hydroplaning. This hazard will be more pronounced in winter months where drainage inlets can be covered by frozen snow, thereby reducing inlet capacity during rain/freezing events.

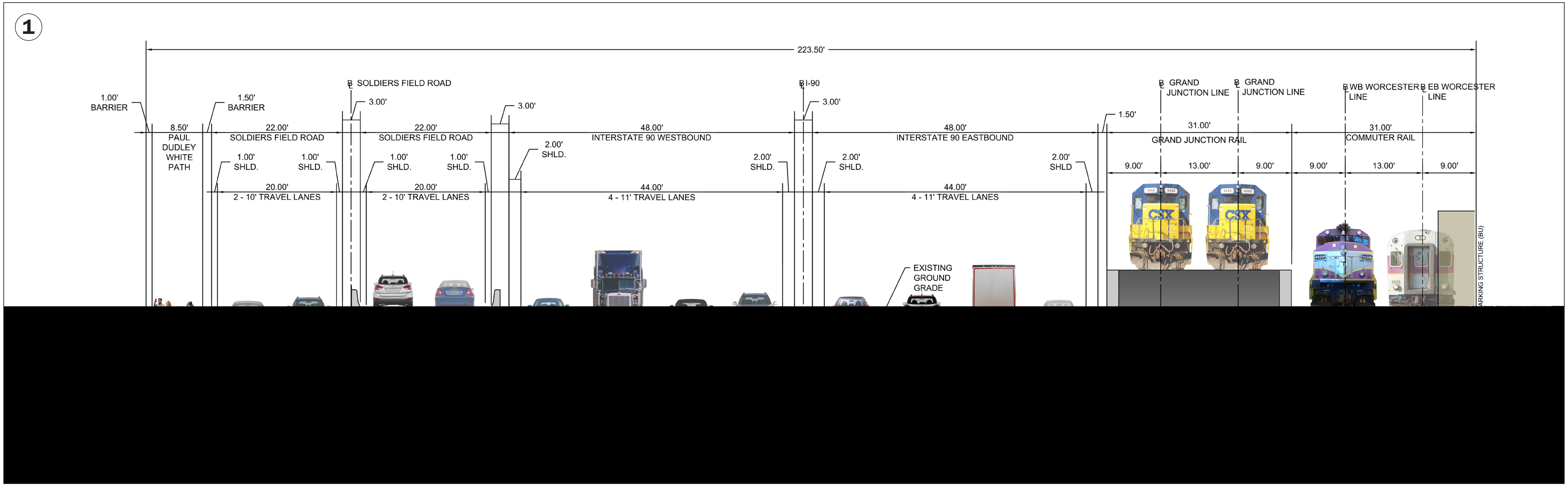
The proposed narrow features in the Throat Area, notably the reduction in median widths and the removal of offset spaces between roadways, creates challenges for placement of guide sign posts and lighting supports that are essential for safe operation along this segment of the Project.

I-90 Eastbound – Snow in shoulder and portion of travel way

The travel lane width reduction from the required 12 feet to the substandard 11 feet will increase the frequency of off-tracking by larger vehicles. In combination with the elimination of standard left and right shoulder widths by the substitution of 2-foot-wide offsets to the adjacent highway barriers, over-recovery maneuvers made in reaction to vehicular encroachment into adjacent lanes will compromise safety in comparison to 3K-HV. Lane width reduction will lead to operational speed reduction by some, but not necessarily all, operators. The introduction of more variable speeds among operators may reduce overall free-flow speeds and increase the probability of sideswipe and rear-end crashes.

3K-AMP's I-90 horizontal alignment at the easterly Project limit will be relatively straight in comparison to the curving transitional alignment of Variation 3K-HV. Straight interstate alignments provide better operational safety in comparison to curving alignments, but the degree of improvement offered by 3K-AMP's straight alignment will be marginal. 3K-HV will compensate for its relatively short length of curving alignment by providing wider, standard travel lanes and shoulders within which safe recovery maneuvers can be made. The proposed I-90 profile will not exceed a gradient of 1.5%, but no measurable safety or operational benefits in profile will be offered by this value in comparison to 3K-HV.

The narrow section proposed under 3K-AMP will reduce the existing 11-foot-wide travel lanes on SFR to 10-foot-wide lanes. Again, the sole reason for the lane width reduction on SFR, similar to the reasoning for reducing the I-90 section width, is to create a narrow section at-grade alternative that fits within the Throat Area and avoids or minimizes environmental impact with the intent of eliminating the I-90 viaduct. The effect of reducing the lane width, in combination with the proposed narrow 1-foot offset to adjacent roadway barrier, will increase the probability of vehicular off-tracking encroachment into the adjacent lane and the frequency of crashes into the barriers under 3K-AMP, as compared with the existing SFR roadway section to be retained under 3K-HV. The curving SFR alignment will extenuate the diminished safety resulting from the lane reduction to 10 feet. In addition, the intended avoidance of environmental impact will not be achieved.


1
223.50'
1.00'
BARRIER
8.50'
PAUL
DUDLEY
WHITE
PATH
1.50'
BARRIER
22.00'
SOLDIERS FIELD ROAD
1.00'
SHLD.
1.00'
SHLD.
20.00'
2 - 10' TRAVEL LANES
℄ SOLDIERS FIELD ROAD
3.00'
22.00'
SOLDIERS FIELD ROAD
1.00'
SHLD.
1.00'
SHLD.
20.00'
2 - 10' TRAVEL LANES
3.00'
2.00'
SHLD.
48.00'
INTERSTATE 90 WESTBOUND
44.00'
4 - 11' TRAVEL LANES
2.00'
SHLD.
℄ I-90
3.00'
2.00'
SHLD.
48.00'
INTERSTATE 90 EASTBOUND
44.00'
4 - 11' TRAVEL LANES
2.00'
SHLD
EXISTING
GROUND
GRADE
1.50'
℄ GRAND
JUNCTION LINE
℄ GRAND
JUNCTION LINE
31.00'
GRAND JUNCTION RAIL
9.00'
13.00'
9.00'
℄ WB WORCESTER
LINE
℄ EB WORCESTER
LINE
31.00'
COMMUTER RAIL
9.00'
13.00'
9.00'
ARKING STRUCTURE (BU)

3K-ABC Cross Section, Looking East (Location of narrowest section of Throat Area)

Variation 3K-ABC

Variation 3K-ABC will not satisfy the minimum AASHTO cross-sectional design requirements for at-grade interstate highways. 3K-ABC proposes 11-foot-wide interstate travel lanes and 2-foot-wide shoulders, which do not meet AASHTO's minimum at-grade interstate design requirements of 12-foot-wide lanes and 12-foot-wide left and right shoulders for high truck volume. The substandard travel lane and shoulder widths are proposed with the intent to create a narrow-width design that fits within the confines of the Throat Area. The safety, maintenance and operational benefits of the 12-foot-wide travel lanes and 8-foot-wide shoulders proposed under the 3K-HV Variation will not be possible.

The proposed at-grade section will provide only 2-foot-wide shoulders in both the westbound and eastbound directions. These shoulder widths are inadequate to safely contain stormwater flow, resulting in stormwater travel lane encroachment and the potential for hydroplaning and safety diminishment. This hazard is even more pronounced in winter months when drain outlets can be covered by frozen snow, thereby reducing inlet capacity during rain/freezing events.

The proposed reduction in travel lane widths from the required 12 feet to the AASHTO substandard 11 feet will increase the risk of off-tracking by larger vehicles. In combination with the elimination of standard left and right shoulder widths with the proposed 2-foot shoulder, over-recovery maneuvers made in reaction to vehicular encroachment into adjacent lanes will compromise safety in comparison to 3K-HV. Lane width reduction leads to operational speed reduction by some, but not all, operators. The introduction of more variable speeds among operators may reduce overall free-flow speeds and increases the probability of sideswipe and rear-end crashes.

Similar to 3K-AMP's I-90 alignment, the horizontal curvature at the easterly Project limit will be better than 3K-HV's alignment, having a smoother transition connecting to the existing I-90 alignment to the east. The narrow section in the Throat proposed under 3K-ABC will reduce the existing 11-foot-wide travel lanes on SFR to 10-foot-wide travel lanes. The sole reason for the lane width reduction on SFR, similar to the reasoning for reducing the I-90 section width, is to create a narrow at-grade section that fits within the Throat Area and avoids or minimizes environmental impact at the Charles River. The effect of lane width reduction, in combination with the proposed 1-foot offset to the adjacent roadside barrier system along SFR, will increase the probability of vehicular off-tracking encroachment into the adjacent lane and potentially increase the frequency of crashes. The curving SFR alignment extenuates the diminished safety resulting from the lane width reduction. In addition, the intended avoidance of environmental impact at the Charles River is not achieved.

The proposed narrow features in the Throat Area, notably the reduction in median widths and the removal of offset spaces between roadways, creates challenges even more pronounced than with the 3K-AMP Variation for the placement of guide sign and lighting supports that are essential for safe operation. This variation proposes 3-foot-wide barrier spaces between roadways which are inadequate for construction.

5.8.2 Future Traffic Operations

The following sections provide a summary of future traffic operational analyses for the interchange alternatives evaluated, including:

- 2040 No Build (Design Year)
- 2040 Build
- 2025 Build (Opening Year)
- 2040 Build with Commonwealth Avenue Connection

Detailed documentation of the traffic modeling and operational results associated with each of these alternatives is presented in the Allston Interchange Traffic Operations Study, which is provided in Appendix C.

From a traffic operational perspective, there is little difference between the three Throat Area Variations under consideration, therefore, the analysis summarized below primarily focuses on future operations at the proposed Allston Interchange ramps and the associated local roadway network.

5.8.2.1 2040 No Build

2040 No Build Roadway Network

In general, the 2040 No Build transportation network will be very similar to the existing transportation network. The configuration of the ramp system within the Allston Interchange will not be altered from the current condition, nor will the alignment of the I-90 Main Line highway (horizontal or vertical). Within the Project Study Area, some minor changes in the pedestrian and bicycle facilities/networks are anticipated to occur by 2040. Those changes/modifications are described in Section 5.7.

Only one substantive change is expected to occur within the primary Study Area for the Allston Interchange that will affect traffic circulation and operations in the No Build conditions -- the construction of Stadium Way by Harvard University. Figure 5.8-1 illustrates the approximate alignment of Stadium Way assumed for the 2040 No Build analysis.

2040 No Build Traffic Volumes

Traffic Forecasting Methodology. The future Design Year traffic volumes used to analyze traffic operations associated with the various alternatives, including the 2040 No Build Alternative, were derived from traffic volume data generated by the CTPS regional travel demand model. The CTPS model uses socio-economic data, such as employment, population, and households, to forecast future motor vehicle use, transit use and walking/pedestrian use with the region.

The CTPS model covers an area in eastern Massachusetts that encompasses 101 cities and towns. Those municipalities have been broken down into 2,727 Traffic Analysis Zones (TAZ). Using data provided to CTPS by regional and local planning agencies such as Metropolitan Area Planning Council (MAPC) and the BPDA, socio-economic data is attributed to each TAZ. Based on factors calibrated and fine-tuned over many years, the model generates a set of productions and attractions between each TAZ, as well as productions/attractions internal to each zone. The productions and attractions can be thought of as a person-trip to or from each zone, or as trip origins and destinations. For example, a trip from a residential location to a work location, from a work location to residential location, or from residential location to a retail or school location.

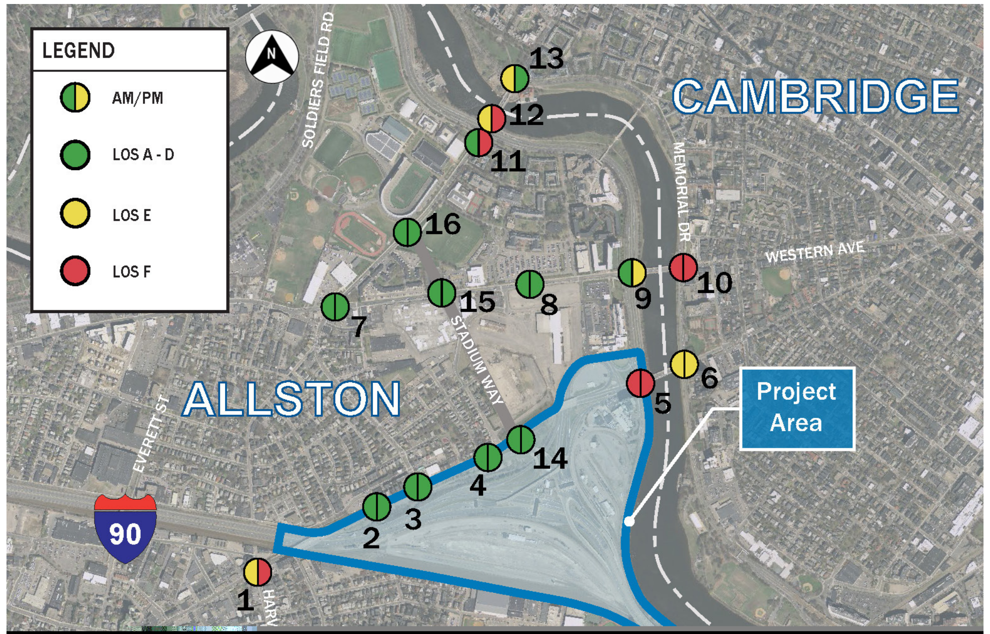
Based on the highway, transit and bicycle/pedestrian infrastructure network assumed in the model for the various alternatives, the model estimates what proportion of those productions and attractions will use the various travel modes to move between each TAZ. This is the step in the process where the transit share and the non-motorized share (i.e., pedestrian/bicycle) are forecast.

For the vehicular mode, once the proportion of vehicle trips between TAZs has been determined, the next step is the assignment of those trips onto the roadway network. Vehicular trips are assigned to various potential routes between each TAZ, based on a number of variables that influence trip length (travel time), such as roadway capacities, free flow speeds, congestion, etc. The results of these CTPS model highway assignments form the basis for the peak hour volumes used in the traffic operational analyses presented herein.

A more detailed description of the CTPS model development, trip forecasting processes (vehicular and transit) and modeling results are provided in Appendix C. Section 5.2.2 provides a summary of the land use assumptions used in the CTPS model, and in particular, the assumptions for TAZs that represent the Harvard University-owned lands in Allston in the vicinity of the Project Area (i.e., the Harvard University Allston Campus and the proposed Harvard University Enterprise Zone). These areas are represented by TAZs 238, 244 and 245 in the CTPS model. For the 2040 No Build scenario, the CTPS model includes the 1.3 million sf of new development that Harvard University estimates will occur in the area during the 10-year period covered by their most recent IMP filing (approximately 2025). Harvard University estimated that approximately 1.6 million additional sf of development would occur on these lands between 2025 and 2040. Therefore, for CTPS modeling purposes, a total of 2.9 million sf of development has been assumed to occur by 2040 within Harvard University's Allston Campus and Enterprise Zone. Appendix C includes diagrams depicting the 2040 AM and PM peak hour traffic volumes used to conduct the traffic operational analyses.

2040 No Build Traffic Analysis Results

Detailed results of the traffic operational analyses (highway, ramps and local intersections) are provided in the Allston Interchange Traffic Operations Study, provided in Appendix C. A graphical summary of the overall operational results (i.e., overall Level of Service – LOS) for signalized intersections within the Traffic Study Area are shown on the following graphic.



2040 No Build Peak Hour LOS Summary (Primary Study Area)

5.8.2.2 2040 Build (Design Year)

Roadway Network

A detailed description of MassDOT's proposed Interchange alternative (Alternative 3K) is provided in Section 3. The roadway network is illustrated on Figure 5.8-2.

The 2040 Design Year interchange network includes roadways that will be constructed by MassDOT and several roadways that have been proposed to constructed by others (Harvard University) and have been assumed to be completed by 2040. The roadways proposed to be constructed by Harvard University include:

- East Drive (between Cambridge Street and Western Avenue)
- Cattle Drive (between Cambridge Street and Western Avenue)
- Stadium Way (between Cambridge Street South and North Harvard Street)
- Hotel Drive (between SFR and Cattle Drive)

On Figure 5.8-2, the roadways to be built by Harvard are shown in orange. The other new roadways will be constructed by MassDOT as part of the Allston Interchange Project, as they are required to accommodate the traffic requirements of the Project.

The 2040 Build scenario also includes construction of West Station as a commuter rail/bus station. The physical attributes and transit services assumed to be provided at West Station are described in Sections 3.2 and 5.9.

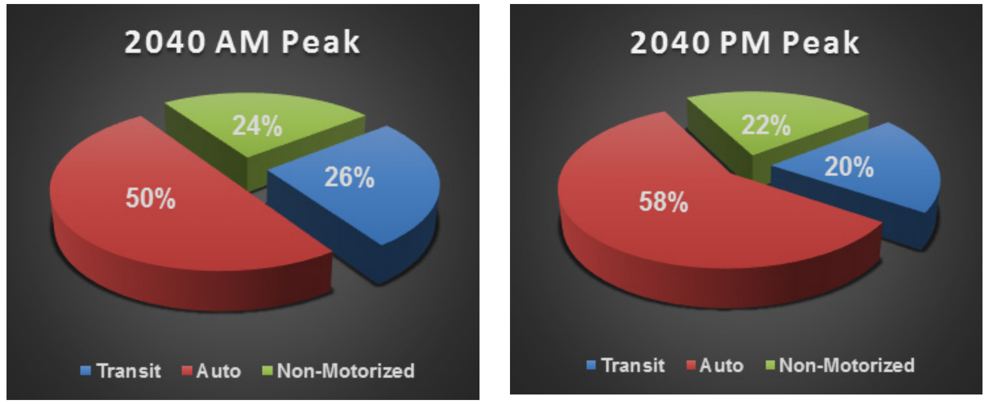
As described in Section 3.3, MassDOT evaluated three Throat Area Variations: 3K-HV, 3K-AMP and 3K-ABC. The Throat Area is the relatively narrow existing multi-modal section where the I-90 viaduct is situated between the Charles River and BU, extending from where I-90 passes under the Commonwealth Avenue bridge to an approximate location about 2,500 feet to the west where the existing I-90 viaduct ends.

Although there are physical differences between the three variations, from a traffic volume forecasting and traffic operations analysis perspective, the three variations are similar (i.e., the roadway network, traffic signal operations and intersection lane requirements within the proposed interchange would be virtually the same). Therefore, for traffic analytical purposes, Variation 3K-HV was chosen as a representative variation for the traffic forecasts and analyses documented in the subsequent sections of the DEIR.

Future Build traffic and transit forecasts for the Preferred Alternative 3K were generated by the CTPS regional travel demand model, using a similar methodology as was used for the forecasts for the No-Build scenario. Details regarding the CTPS modeling methodology are described in Appendix C, Traffic Operations Study. The traffic forecasts developed by CTPS were based on a set of future land use assumptions for the Project Area (i.e. within the BPY), which were layered onto the land use assumptions developed for the 2040 No Build scenario.
As discussed in Section 5.2.2, the No Build scenario assumes approximately 2.9 million sf of new development by Harvard University at their Allston Campus and Enterprise Zone (TAZs 238, 244 and 245). For the Build scenario, the CTPS model assumed an additional 4.1 million sf of development by Harvard University within the BPY (TAZ 246), for a total of approximately 7 million sf of new development by 2040.

2040 Traffic Volumes

Mode Share Results. As discussed previously in the description of the 2040 No Build traffic projections, after the CTPS model forecasts how many person-trips are expected to be generated by the land uses within the Project Area, the regional model also provides forecasts regarding which travel mode will be used to make those person trips (i.e., motorized vs. transit or non-motorized). For this analysis, CTPS was asked to provide mode share forecasts for the four TAZs (see Figure 5.8-3 for locations) that comprise Harvard's Allston Campus, Enterprise Zone and the BPY area. A summary of the mode share predictions for all trip types within these areas in 2040 is presented in charts below for the AM and PM peak hours. More detailed data from the CTPS mode choice analysis can be found in Appendix C.



2040 Build Mode Share Forecasts

Project Area Vehicle Trip Generation. Table 5.8-2 presents a summary of peak hour vehicular trip generation forecasts for the four development TAZs within the Project Study Area from the CTPS model. As noted in the table, approximately 3,000 vehicle trips (existing + new) are expected to travel to or from these development areas during the 2040 AM peak hour. It is estimated that 67% of those trips will be arriving trips. In the 2040 PM peak hour, more than 4,200 trips are expected to be generated within these development areas. The directionality split during the PM peak is expected to be approximately 57% exiting trips and 43% entering trips. Of the total entering/exiting vehicle trips within the Project Area, 33 to 34% of those trips will have origins or destinations within the new development at the BPY during both the AM and PM peak hours.

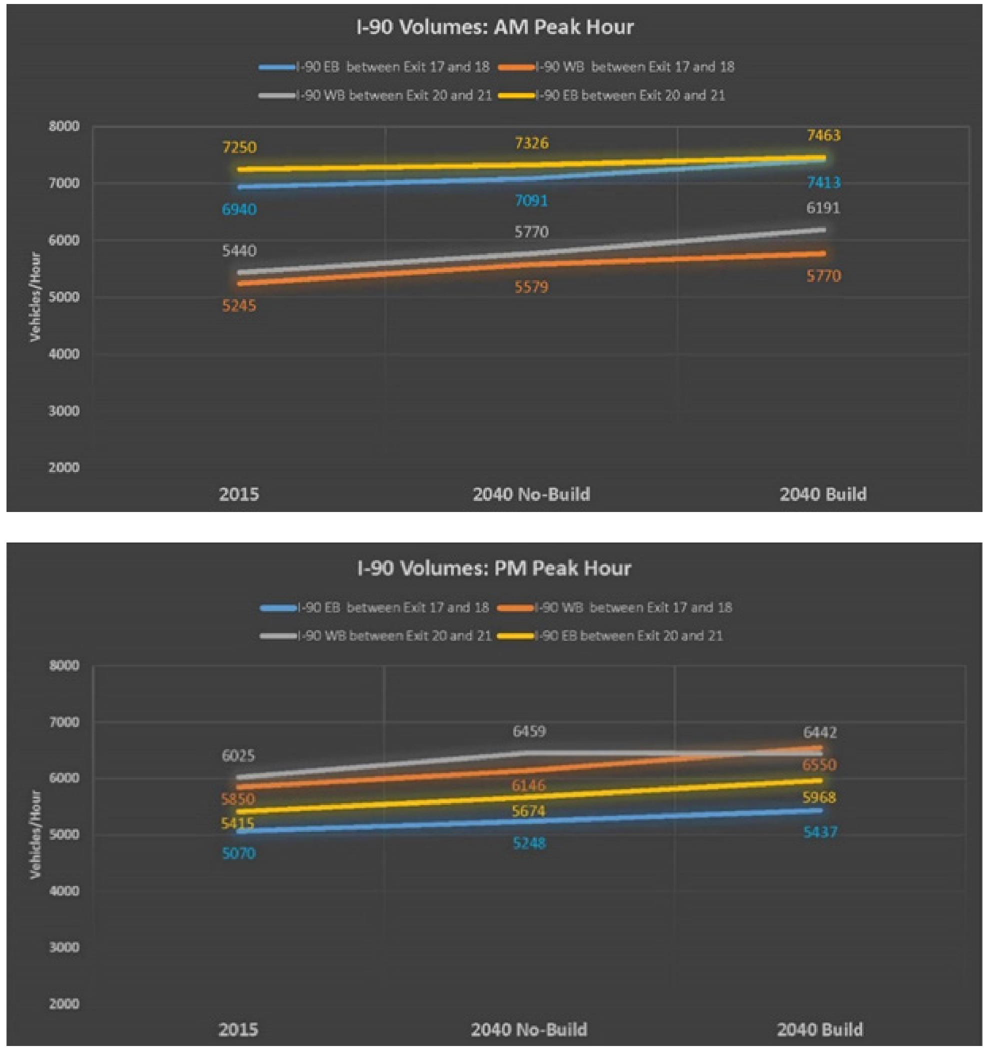
Table 5.8-2 Project Area Peak Hour Vehicle Trip Generation Forecasts

Trip Type/Location	AM	PM
TAZ 238 (HU Athletic Area)		
Enter	182	256
Exit	106	271
Total	288	527
TAZ 244 (HU Business School)		
Enter	564	568
Exit	351	641
Total	915	1,209
TAZ 245 (HU Enterprise Zone)		
Enter	586	405
Exit	219	633
Total	805	1,038
TAZ 246 (BPY)		
Enter	670	599
Exit	321	862
Total	991	1,461
Total Enter	2,002	1,828
Total Exit	997	2,407
TOTAL TRIPS	**2,999**	**4,235**

Project Area includes Traffic Analysis Zones (TAZ) 238, 244 (Harvard University Allston Campus), TAZ 245 (Harvard Enterprise Zone) and TAZ 246 (Harvard University development at Beacon Park Yard)

I-90 Mainline Volumes. Vehicular traffic traveling to/from the development areas near the Allston Interchange will use a variety of routes depending upon their origins or destinations (local versus regional). Route selection is based on a number of predictive factors in the CTPS model such as roadway capacities, travel speeds and congestion/delays. Another important factor is the use of local or regional roadways by users with both trips to/from land uses outside the Project Study Area – i.e., drivers who are passing through the Study Area. The most critical roadway providing access to/from the project area, as well as a connection between Boston and the region west of city is Route I-90.

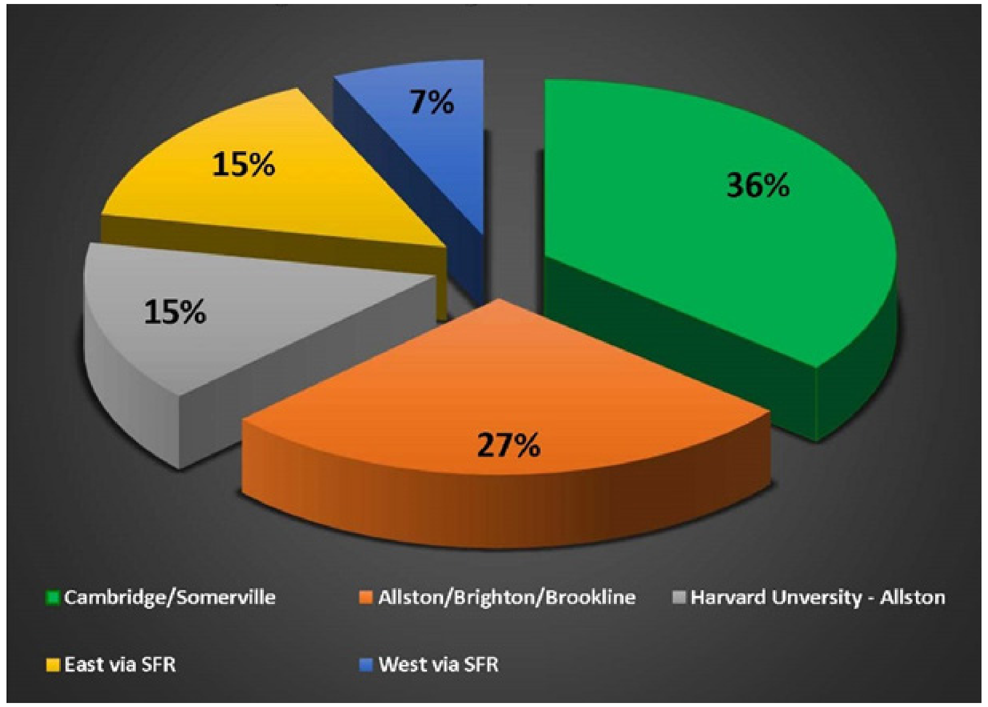
The charts at right provide a summary of expected growth in traffic volumes expected on I-90 between 2015 and 2040. They indicate that traffic on I-90 Main Line is expected to grow by a total of 7.9% between 2015 and the 2040 Build conditions in the AM peak hour (0.3% per year), and by 9.1% in the PM peak hour (0.4% per year).



Expected Growth in Traffic Volumes on I-90 Between 2015 and 2040

I-90 Ramp Volumes. In the AM peak, ramps volumes on average are expected to increase additional 11% between the No Build and Build scenarios. In the PM peak hour, an additional 15% increase is expected on the I-90 ramps (on average). Overall ramp traffic growth from 2015 to the 2040 Build conditions is forecast to be approximately 20% in the AM peak (0.8 percent per year) and approximately 32% in the PM peak (1.3 percent per year).

I-90 Ramp Users. MassDOT also examined the future ramp projections in order to gain an understanding of the composition of the expected users of the interchange in the future once the improvements are constructed. This understanding was accomplished with assistance of CTPS, which performed a "select link analysis" for each of the ramps at the interchange. This analysis showed the travel paths through the Study Area to/from each ramp and revealed the user's anticipated origins or destinations. The select link analysis was performed for the AM and PM peak periods. The chart below provides as graphical summary of the forecasted origins/destinations of the interchange users in 2040 from the CTPS model. The data represents an average for all four ramps (eastbound on and off; westbound on and off) for the AM and PM peak hours.



Interchange Users Origins/Destinations in 2040

Cordon Line Volumes. A cordon line analysis (traffic entering/exiting the traffic Study Area perimeter) was also performed to understand how traffic entering the Traffic Study Area is expected to change between 2040 No Build and 2040 Build conditions. The cordon line included local streets, ramps from SFR, as well as the I-90 ramps. In general, traffic volumes entering the Primary Traffic Study Area are expected to increase by approximately 10% in the AM peak and by 2% in the PM peak.

2040 Build Traffic Analysis Results

Operational Goals. During the concept development phase of the Project, MassDOT identified several Design Year traffic operational goals for the various elements of the interchange Project. These goals were used to determine the proposed lane configurations, roadway alignments and connectivity requirements between the highway and the local roadway system associated with the proposed interchange alternative. The Project elements included:

- I-90 highway/ramp operations
- Operations at the intersections at the I-90 ramp termini and along the I-90 frontage/service roads
- Local intersections that will be either modified or created by the Project because of the reconfiguration of the existing ramps system
- Improving safety for vehicular traffic on the I-90 Main Line and ramps and for all modes at local intersections and at the I-90 ramp termini

I-90 Highway/Ramps

For I-90 Main Line and ramp merge/diverge operations, MassDOT's goal was to try to achieve an LOS D or better during the peak periods, with LOS E operations as the minimum. Maintaining at least LOS E operations on the I-90 Main Line on the viaduct area east of the interchange is one of the factors why that cross section will remain as an eight-lane cross-section (4 lanes per direction) instead of being reduced to six lanes (3 lane in each direction). Analyses conducted by MassDOT indicated that if the cross-section were reduced to six lanes then operations will be over capacity (LOS F).

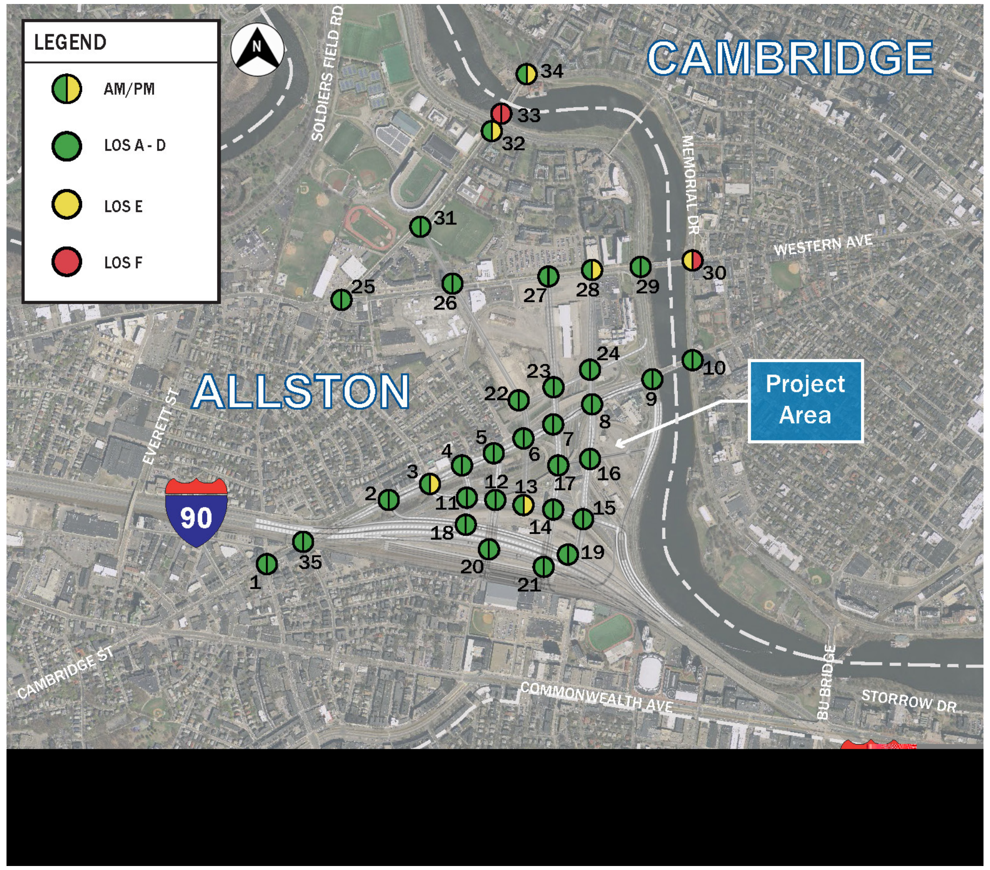
Ramp Termini Intersections/Frontage Roads

The functionality of these four intersections (two eastbound ramps and two westbound ramps) will be critical for the overall safety and efficiency of the proposed interchange project, as well as for the I-90 Main Line. If insufficient capacity were to be provided at these intersections, long ramp queues will likely result that could extend back to the I-90 Main Line and negatively affect operations and safety on the highway. Therefore, MassDOT carefully considered what the operational goals should be for these intersections. The Design Year goals for these intersections were an overall LOS D or better, with a volume-to-capacity (v/c) ratio of less than 1.00 and sufficient queue storage to accommodate the 95th percentile queues on the off ramps and between the intersections along the frontage roads.

Local Intersections

For the local intersections modified or created by the Project, MassDOT's goal was to provide sufficient capacity (i.e., number of lanes and turn pockets) to achieve an overall LOS E or better with a v/c ratio of approximately 1.00 or less during peak periods. In addition, sufficient queue storage will be needed to accommodate the 95th percentile queue between intersections and in left or right turn lanes to avoid queues spilling out and blocking through lane operations. Minimally, the 50th percentile queue (i.e., the average queue) should be accommodated between intersections and within turn lanes at these intersections.

Operational Results. Detailed results of the traffic operational analyses (highway, ramps and local intersections) are provided in the *Allston Interchange Traffic Operations Study,* provided in Appendix C. A graphical summary of the overall intersection operational results within the Traffic Study Area is provided below.



2040 Build Peak Hour LOS Summary

Of the 35 intersections evaluated for the 2040 Design Year roadway network, 26 are either new or modified intersections that will be constructed by MassDOT or Harvard University. Of the 26 new/modified intersections, all will meet MassDOT's design goal of achieving an overall LOS E or better in both peak hours.

Additionally, significant operational improvements are expected at the intersection of Cambridge Street and SFR, where overall operations are expected to improve from LOS F to LOS B in both peak hours. These operational improvements are a result of two actions: (1) removing the SFR westbound off ramp from the intersection, thereby simplifying the signal phasing; and (2) relocating the traffic getting onto SFR eastbound at this intersection from I-90 and Cambridge Street to the new on-ramp location from intersection of Cambridge Street South/East Drive.

SFR Westbound Off Ramp. As referenced above, elimination of the SFR westbound off ramp helps simplify the signal phasing at the intersection of Cambridge Street/SFR. Today, this intersection is controlled by a complex 5-phase signal that is over capacity during the morning and afternoon peak commuting periods, resulting in long delays and lengthy queues for drivers on most approaches. With the 3K Preferred Alternative, signal operations will be simplified to two phases as the I-90 off ramp, SFR westbound off ramp and the hotel exit driveway signal phases will be eliminated. This change will allow the significant operational improvements noted above to be realized at this location. On a daily basis, delays for tens of thousands of drivers will be reduced, and safety for hundreds of pedestrians/bicyclists will be enhanced, because of the elimination of the SFR ramp.

Elimination of the SFR westbound off-ramp will result in a route modification for those drivers on SFR westbound who wish to cross the Charles River into Cambridge. With the Project, they will exit SFR at the new SFR westbound off-ramp to East Drive Connector, turn right onto that roadway northbound and then turn right again onto Cambridge Street eastbound to cross the Charles River into Cambridge. Geographically, this route will be approximately 800 feet longer than the current route and will require passing through three additional traffic signals. However, in terms of travel times, the new route will be equal to, or even shorter than, the current route when considering the growth of traffic that is forecasted to occur by 2040 without the Project.

The elimination of the ramp will affect approximately 90 drivers in the AM peak hour and approximately 150 drivers in the PM peak hour. These drivers constitute only 2.5% of the volume entering the intersection in the AM peak hour (90 of 3,650 vehicles per hour - vph) and 3.7% of the total entering volume in the PM peak hour (150 of 4,215 vph). Traffic analysis performed for the 2040 No Build Alternative indicate that delays for right turns on the SFR westbound off-ramp will be in excess of 300 seconds (5+ minutes) in the AM and PM peak hours. This is a result of volumes increases expected in the future on this ramp, even without the Project and redevelopment at the BPY. The volume increases are part regional in nature (traffic destined to I-90) and part local in nature; new development at the Harvard Allston Campus and Enterprise Zone and the New Balance site, for example.

In contrast to the No Build ramp delays, with implementation of the Project, delays for right turns on the westbound SFR off-ramp approach to the intersection with East Drive Connector is expected to be 20-25 seconds (LOS B/C) in the AM/PM peaks; delays for right turns on the East Drive northbound approach to Cambridge Street are forecast to be in the 20-40 second range (LOS C/D); and the delays on the Cambridge Street eastbound approach to the SFR Frontage Road only 10-15 seconds (LOS A/B).

Stadium Way Transit-Only Option

Background and Modeling Assumptions. For the modeling and traffic analysis associated with MassDOT's 2040 Design Year, Stadium Way was assumed to be a two-way facility open to all traffic for its entire length (North Harvard Street to Cambridge Street South). This assumption was also included in the 2040 No Build modeling and traffic analysis. However, Harvard University has discussed the possibility of restricting some segments of Stadium Way to just transit vehicles in the future.

At this time, the functionality of Stadium Way is uncertain in the Design Year. MassDOT and CTPS prepared additional model runs of the 2040 Build condition that assumed use of some portions of Stadium Way will be restricted to transit vehicles only (i.e., buses). Specifically, the following changes were made to the 2040 Build roadway network for CTPS modeling for this "transit-only" option:

- Stadium Way in the southbound direction between Western Avenue and Cambridge Street South will be restricted to buses only
- Turn movement prohibitions for non-transit traffic at the following intersections to restrict non-transit trips onto Stadium Way southbound:
    - Western Avenue/Stadium Way
    - North Connector Road/Stadium Way
    - Cambridge Street/Stadium Way
- Stadium Way northbound between Cambridge Street South and Western Avenue would remain open to all traffic
- Stadium Way northbound and southbound between Western Avenue and North Harvard Street would remain open to all traffic

Modeling Results. The CTPS modeling results for this option indicate that the network changes noted above will not have much of an effect on traffic volumes entering/exiting the Traffic Study Area, or on the traffic volumes projected to use the I-90 ramps in 2040.

Cordon line data for this option, for example, indicates that volumes entering the Study Area will be approximately 0.1% less in the AM peak hour as compared to the base interchange alternative. Similarly, the difference in volumes entering the Study Area in the PM peak hour with this option are projected to be only 0.4% less than the base alternative (an approximate 25 vehicle difference out of 9,700 entering vehicles in this hour).

In terms of the I-90 ramp volumes, in the AM peak hour, the total volume on all four ramps is forecast to be approximately 0.3% less with this option as compared to the base alternative (16 less trips). In the PM peak, the average difference at the I-90 ramps is expected to be approximately 0.6% less (41 less vehicles spread out over the four ramps, out of a total volume of over 6,800 vph.

The more tangible differences associated with this option are in terms of internal circulation and routing within the Study Area. The CTPS model results indicate that in the 2040 base alternative, approximately 295 vehicles will be traveling south on Stadium Way from Western Avenue in the AM peak hour, and approximately 405 vehicles in the PM peak hour. If use of the southbound direction of Stadium Way were restricted to transit vehicles only, those southbound drivers will shift to North Harvard Street, Cattle Drive or East Drive. Based on the CTPS modeling results, the following shifts will be expected to occur in the southbound direction as a result of travel restrictions on Stadium Way:

- North Harvard Street: Approximately 11% of traffic from Stadium Way southbound (32 vehicles) in the AM peak hour and approximately 5% of the traffic in the PM peak hour (20 vehicles) are forecast to shift to North Harvard Street southbound.
- Cattle Drive: Approximately 47% of the Stadium Way southbound traffic in the AM peak hour (138 vehicles) and 63% of the traffic in the PM peak hour (257 vehicles) will shift from Stadium Way to Cattle Drive southbound.
- East Drive: Approximately 36% of the traffic on Stadium Way southbound in the AM peak hour (105 vehicles) and approximately 10% percent of the traffic in the PM peak hour (39 vehicles) will shift from Stadium Way to East Drive southbound. Based on the model results, it appears that most of these trips would likely chose to stay on SFR eastbound to the off-ramp to Western Avenue rather than traveling down North Harvard Street to Western Avenue.
- Approximately 6% (AM) and 22% (PM) of the Stadium Way southbound traffic will find other routes in the region outside the Traffic Study Area to travel from north to south if Stadium Way southbound had user restrictions.

Finally, it is important to note that with either option (i.e., with Stadium Way open to all traffic or limited to buses-only in the southbound direction), 2040 traffic volumes on North Harvard Street between Cambridge Street and Western Avenue will be less than in the existing conditions. In the base condition, the 2040 volumes on North Harvard are projected to be approximately 34% lower in the AM peak and approximately 19% lower in the PM peak. With the transit restrictions on Stadium Way, North Harvard Street volumes will be 30% lower in the AM peak and 17% lower in the PM. These projected volume decreases on North Harvard Street are due to introduction of three new north-south roadways between Cambridge Street and Western Avenue (Stadium Way, Cattle Drive and East Drive), which gives north-south drivers in the area options to using North Harvard Street.

5.8.2.3 2025 Build (Opening Year)

Background

The 2040 Build Design Year Alternative described in Sections 3 and 5.8.2.2 includes several roadways that will be built by others (Harvard University) and not by MassDOT as part of the Project. The Harvard-constructed roadways assumed to be in place by 2040 are primarily located between Cambridge Street and Western Avenue and will serve the Enterprise Zone. In order to demonstrate that the roadway network to be built by MassDOT will function adequately without the Harvard-constructed roadways, an "Opening Year Alternative" analysis has been performed. For the purposes of this analysis, MassDOT has assumed an Opening Year of 2025.

2025 was selected for the opening analysis year, in part, because it enabled the use of 2025 regional land use projections developed by CTPS in the transportation modeling for the Opening Year Alternative. The CTPS model for the Opening Year Alternative also includes regional transit and highway infrastructure projects on the Long Range Transportation Plan (LRTP) that are expected to be completed by 2025. Because the Project will be phased, the 2025 Opening Year Alternative does not include West Station. From a local land use perspective, the 2025 analysis includes the development quantities documented in Harvard's 2013 10-year IMP document, including their latest proposal for the Allston Science Center (2015 filing).

2025 Roadway Network

The concept plan for the 2025 Opening Year roadway network to be constructed by MassDOT is illustrated on Figure 5.8-4. The key roadway elements included in the Opening Year Alternative are:

- Reconstruction of Cambridge Street from Lincoln Street to SFR
- Elimination of the SFR westbound off-ramp to Cambridge Street
- Construction of new SFR on- and off-ramps approximately 1,500 feet south of the intersection of Cambridge Street/SFR
- Construction of a boat section on the SFRMain Line that will carry the Main Line under the new SFR on- and off-ramps
- Construction of Cambridge Street South from North Harvard Street to East Drive/relocated SFR ramps
- Construction of the North Connector Road as a one-way westbound facility between the SFR Frontage Road and Cattle Drive
- Construction of three north/south connector roads between the I-90 ramp system and Cambridge Street as two-way facilities: West Connector, Seattle Street Connector and Cattle Drive Connector

- Construction of East Drive Connector/East Drive between the I-90 ramp system and the North Connector as a two-way facility

The Opening Year network does include one additional roadway that is assumed to be constructed (or funded) by Harvard University by 2025:

- East Drive between the North Connector and Western Avenue as a two-way facility

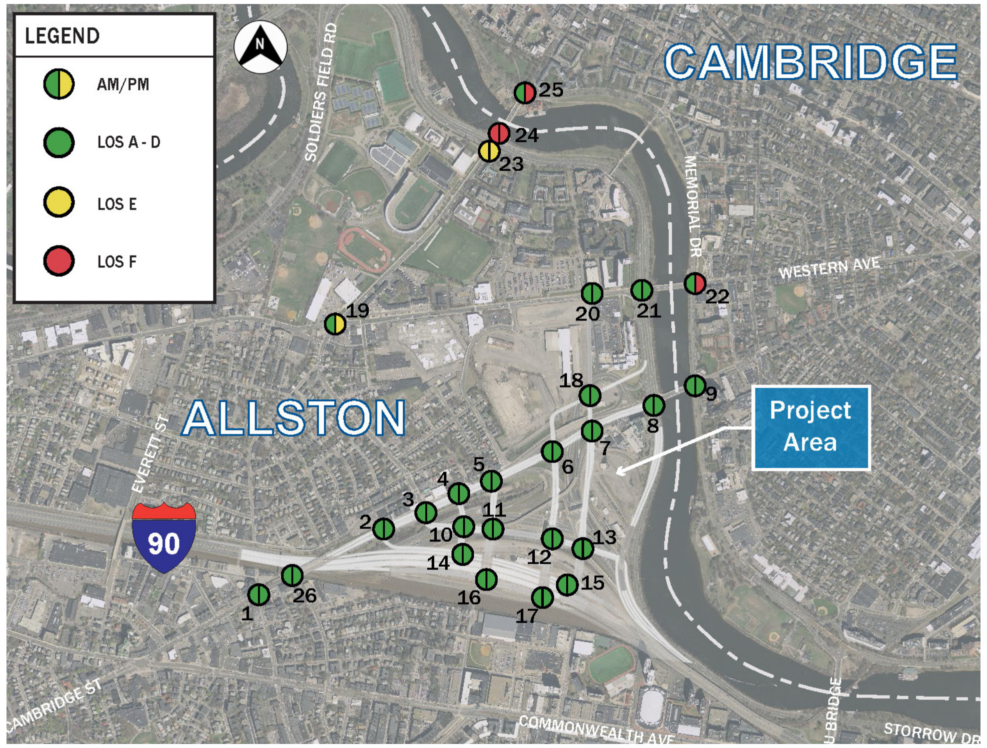
2025 Traffic Volumes

2025 Project Area Trip Generation Forecasts. The growth in employment and population expected to occur at Harvard University's Allston Campus and Enterprise Zone by 2025 will translate into increased traffic traveling through the Study Area. Total trip generation (existing + proposed) expected at these development areas by 2025 will be approximately 1,500 vehicle trips during the AM peak hour (entering plus exiting) and approximately 2,300 trips during the PM peak hour. Of the 1,500 trips in the AM peak, approximately 31% (about 470 trips) will come from, or be headed to, I-90. In the PM peak, it is anticipated that approximately 25% of the 2,300 trips (about 575 trips) will have an orientation to/from I-90.

Local Street Volumes (Cordon Line). Similar to the 2040 Design Year Build scenario, a cordon line analysis was performed to understand how traffic entering the Primary Traffic Study Area is expected to change between the 2015 Existing and the 2025 Build conditions. Overall, traffic volumes entering the Traffic Study Area are expected to increase by approximately 5% in the AM peak and by 8% in the PM peak by 2025.

2025 Build Traffic Analysis Results

A graphical summary of the projected overall traffic operations at intersections within the Traffic Study Area in the 2025 Build condition is provided below. All intersections that will be created or modified by the interchange Project are expected to function at an overall LOS D or better in both the AM and PM peak hours. Additionally, there are several locations where the operations in 2025 are expected to be better than in the 2015 Existing conditions because of the proposed interchange improvements. Most notable among those locations is the intersection of Cambridge Street/SFR, where operations are projected improve from LOS F to LOS B in the AM and PM peak hours.



2025 Build LOS Summary

5.8.2.4 2040 Build with Potential North-South Roadway Connection to Commonwealth Avenue

Background

The genesis of this variation to MassDOT's proposed interchange alternative was comments from the community and the Project's Task Force on the Project ENF. In the MEPA Certificate on the Project's ENF, EEA required MassDOT to evaluate a potential north-south vehicular connection between Commonwealth Avenue and the proposed reconfigured I-90 interchange. Based on discussions at various Task Force meetings, the community's intent in requesting that MassDOT evaluate this new connection is to generally improve north-south connectivity, as well as to assess what potential traffic reductions might be realized on the portions of Harvard Avenue and Linden Street north of Brighton Avenue, if this new roadway connection is provided by the Project. Because of grade (elevation) constraints and connectivity limitations associated with West Station and the I-90 interchange, the most practicable location for this connection was determined to be via Malvern Street.

For analytical purposes, two distinct options of this alternative were evaluated:

- Use of this potential connection assumed to be open to all traffic
- Use of the new roadway north of Ashford Street to be restricted to transit vehicles (buses) only

At this time, MassDOT is not proposing to take any actions relative to constructing a connection that is either open to general use traffic or limited to transit only, as part of this Project. Infrastructure constructed as part of this Project will not preclude this future connection should others wish to pursue this as a separate project. Also, for traffic analytical purposes, Variation 3K-HV was used as a representative interchange alternative to evaluate this potential north-south connection, as traffic volume forecasts for the three Throat Area variations considered in the DEIR would be similar. The evaluation results of this alternative connection are described below.

General Traffic Option

Traffic Volumes. Table 5.8-2 provides a summary of the CTPS forecasted traffic volumes expected to use the new roadway connection in the AM and PM peak hours. Not unexpectedly, in the AM peak hour traffic is expected to be heavier in the northbound direction (towards the interchange), while the in the PM peak both directions are forecasted to have similar traffic levels. North of Ashford Street approximately 1,725 vph are forecasted to use the Malvern Street Extension in the AM peak hour, while in the PM peak the two-way volume on the new roadway is expected to be approximately 2,110 vph. The peak directional volumes are projected to be approximately 1,065 vph in the AM peak (northbound) and approximately 1,060 vph in the PM peak (northbound). On a daily basis, it is estimated that approximately 15,000 to 20,000 vehicles per day would use this connection.

Table 5.8-2: Commonwealth Avenue Roadway Connection: Projected Traffic Volumes

Location	AM Peak			PM Peak		
	NB	SB	Total	NB	SB	Total
Malvern Street Extension north of Ashford Street	1,065	660	**1,725**	1,050	1,060	**2,110**

Notes: Volumes are in vehicles per hour (vph). NB = northbound; SB = southbound

Table 5.8-3 provides a 2040 volume comparison summary between the proposed base interchange alternative and the alternative with the potential new connection to Commonwealth Avenue for the AM and PM peak hours. The volume comparisons are provided for the Study Area's key local roadways that will be most affected by this connection including Cambridge Street, Harvard Avenue, Linden Street, Babcock Street and Packards Corner.

Table 5.8-3: 2040 Peak Hour Traffic Volume Comparison: Commonwealth Ave Connection vs. Base Alternative

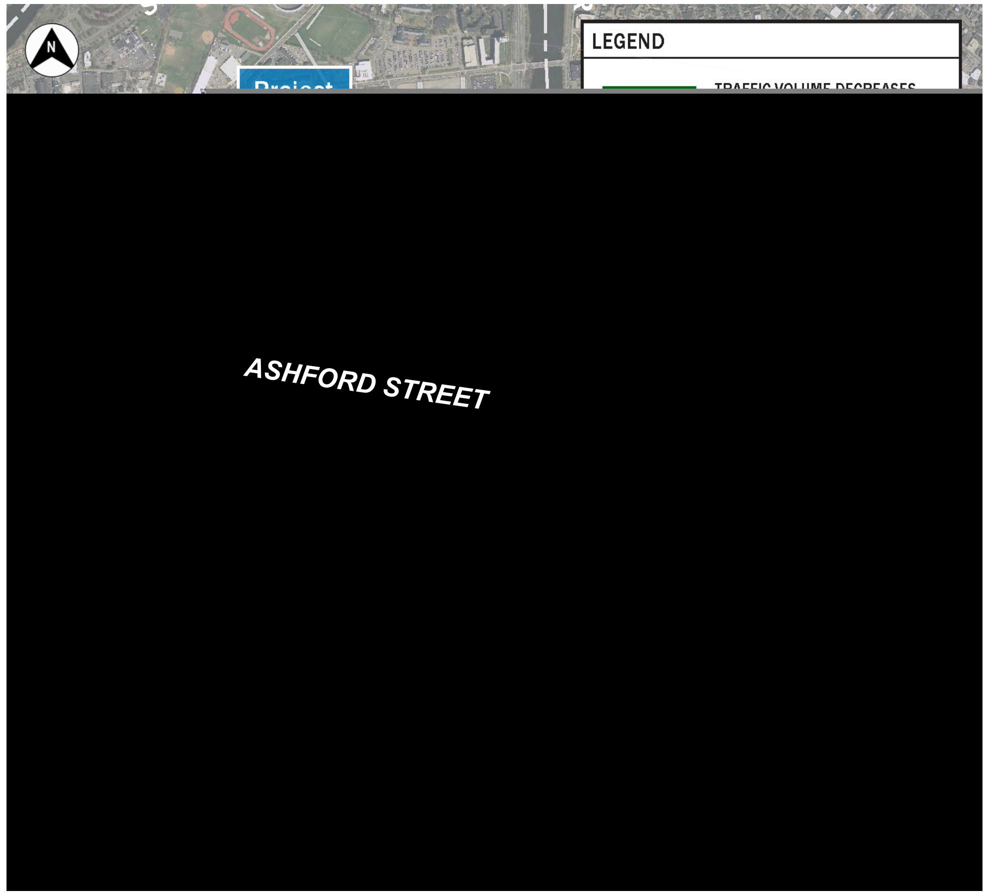
Location	Vehicles per hour (vph)			
	Base Alternative	Alt with Comm Ave. Connection	Net Change	% Change
AM Peak Hour				
Harvard Avenue (south of Cambridge Street)	903	690	-213	-24%
Linden Street (south of Cambridge Street)	560	305	-255	-46%
Cambridge Street (on I-90 overpass)	3,030	2,570	-460	-15%
Brighton Avenue (west of Malvern Street)	1,210	1,040	-170	-14%
Packards Corner	2,280	2,790	510	22%
Malvern Street (south of Ashford Street)	115	1,070	955	830%
Ashford Street (west of Malvern Street)	88	250	162	184%
Chester Street (south of Ashford Street)	155	295	140	90%
Ashford Street (east of Malvern Street)	130	605	475	365%
Babcock Street (north of Commonwealth Ave.)	335	585	250	75%
Babcock Street (south of Commonwealth Ave.)	565	835	270	48%
Pleasant Street (south of Commonwealth Ave.)	260	495	235	90%
PM Peak Hour				
Harvard Avenue (south of Cambridge Street)	1,095	895	-200	-18%
Linden Street (south of Cambridge Street)	450	175	-275	-61%
Cambridge Street (on I-90 overpass)	3,345	2,815	-530	-16%
Brighton Avenue (west of Malvern Street)	1,830	1,300	-530	-29%
Packards Corner	2,530	3,030	500	20%
Malvern Street (south of Ashford Street)	115	1,295	1180	1026%
Ashford Street (west of Malvern Street)	90	170	80	89%
Chester Street (south of Ashford Street)	160	240	80	50%
Ashford Street (east of Malvern Street)	115	790	675	587%
Babcock Street (north of Commonwealth Ave.)	285	650	365	128%
Babcock Street (south of Commonwealth Ave.)	475	695	220	46%
Pleasant Street (south of Commonwealth Ave.)	270	455	185	69%

Table 5.8-4: Commonwealth Ave. Connection: Summary of Benefits and Impacts

Type/Location	Benefits	Impacts
Traffic Volumes		
Harvard Avenue, south of Cambridge Street	Reduced traffic in AM & PM	
Linden Street, south of Cambridge Street	Reduced traffic in AM & PM	
Cambridge Street, west of N. Harvard Street	Reduced traffic in AM & PM	
Malvern Street		Increased traffic in AM & PM
Ashford Street, east of Malvern Street		Increased traffic in AM & PM
Ashford Street, west of Malvern Street		Increased traffic in AM & PM
Babcock Street, north of Comm. Avenue		Increased traffic in AM & PM
Babcock Street, south of Comm. Avenue		Increased traffic in AM & PM
Pleasant Street, south of Comm. Avenue		Increased traffic in AM & PM
Chester St., Brighton Ave to Ashford Street		Increased traffic in AM & PM
Traffic Operations		
Harvard Ave/Cambridge Street	Improved operations in AM	
Cambridge Street/Lincoln Street	Improved operations in AM	
Cambridge Street/North Harvard Street	Improved operations in AM	
Harvard Ave/Brighton Avenue	Improved operations in AM	
Packards Corner		–Degraded operations in AM & PM –SB queue on Malvern St. impacts adjacent Malvern St. intersections
Commonwealth Avenue/Babcock Street		–Removal of on-street parking on both Babcock St approaches –Degraded operations in AM
Malvern Street/Ashford Street		–Degraded operations in AM & PM –SB queue on Malvern St. Ext. impacts adjacent intersections
Route I-90 EB off-ramp/Seattle Street Conn.		–Degraded operations in AM & PM –NB & SB queues impact adjacent intersections on Seattle St. Conn. & Malvern St. Ext.
Project Costs		
Construction of additional Viaduct, Roadway & Signal Improvements		–Approx. $14 million in additional costs
Right-of-Way		–Costs to acquire property at 76 Ashford Street –Costs to relocate existing business at 76 Ashford Street

Summary of Benefits and Impacts. The analysis performed for this alternative indicates that the provision of a new roadway connection between Commonwealth Avenue and the I-90 Allston interchange that is open to general traffic will result in a mix of benefits and impacts within the Primary and Secondary Traffic Study Areas. Table 5.8-4 provides a summary of the important positive and negative implications associated with providing this roadway connection. A graphical summary of where roadway volumes will increase or decrease, and where operational improvements or impacts would occur if the new roadway connection is made is provided below.

More detailed information regarding the analysis of this option is provided in the *Allston Interchange Traffic Operations Study* (Appendix C).



Commonwealth Avenue Connection Traffic Benefits vs. Impacts Summary

Transit-Only Option

Because of the numerous traffic impacts associated with the General Traffic Option, (some of which are significant flaws, e.g., the impacts at Packards Corner and at the I-90 eastbound off-ramps), which, collectively, appear to outweigh the benefits that will be realized on a few streets), MassDOT also evaluated an option that restricts access to the new roadway connection north of Ashford Street to transit vehicles (i.e., buses only).

In the Transit-Only Option, buses traveling to West Station from the south will do so via Commonwealth Avenue westbound to Packards Corner, turning right onto Brighton Avenue and right again onto Malvern Street northbound to the West Station Bus Loop. For buses exiting West Station with destinations to the south, buses will turn left out of the West Station Bus Loop onto Malvern Street Extension southbound to Packards Corner, then turn left onto Commonwealth Avenue eastbound. This route will require implementation of the same geometric and signal phasing changes at Packards Corner as with the general traffic option in order to allow buses to turn left out of Malvern Street. The traffic analyses performed for this alternative determined that there will be significant operational impacts at Packards Corner if this alternative were implemented.

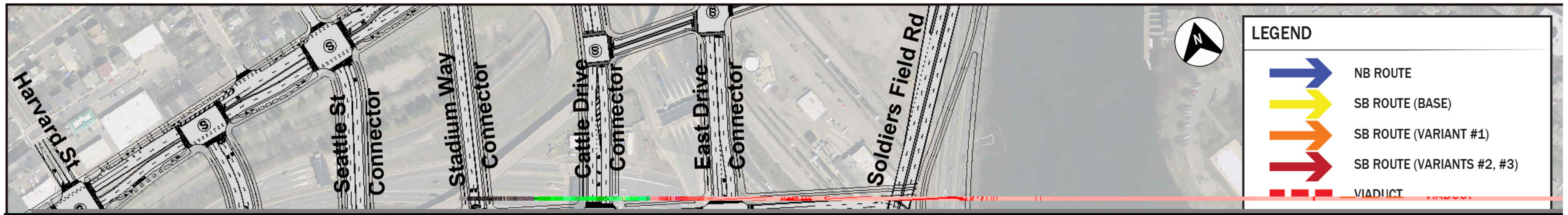
Bus Routing Options. The significant operational impacts at Packards Corner associated with the Transit-Only Option were considered unacceptable by the City of Boston because of the critical nature of this intersection to operations along the Commonwealth Avenue corridor for both vehicles and the MBTA Green Line. Consequently, MassDOT was asked to explore additional route options for the southbound bus traffic, while maintaining the northbound bus route via Packards Corner to Malvern Street. It was anticipated that the northbound buses will have only minimal impacts on operations at Packards Corner, as no changes to signal phasing/operations will be required, just minor geometric modifications at the northeast corner of the Brighton Avenue/Malvern Street intersection in order to accommodate the turning radii of the right-turning northbound buses.

For southbound buses exiting West Station, three additional route options were evaluated by MassDOT. Those route variants were:

1. Via Malvern Street southbound, left onto Gardner Street eastbound, straight through the four-way STOP at Alcorn Street, turn right onto Babcock Street southbound to the signal at Commonwealth Avenue, where the buses will turn left onto Commonwealth Avenue eastbound
2. Via a new transit-only roadway that will be constructed from the east end of the West Station Bus Loop and that will connect to the BU North Service Road behind the Agganis Arena in the vicinity of the intersection of the North Service Road and Harry Agganis Way. From this point buses will travel eastbound on the North Service Road to Buick Street southbound to the signal at Commonwealth Avenue, where the buses will turn left onto Commonwealth eastbound
3. Similar routing as with Variant #2, except that, for analytical purposes, it was assumed that the North Service Road and Buick Street will have one-way eastbound/southbound operations instead of having two-way circulation

I-90 Bus Route Option. MassDOT was asked to consider a bus routing option that did not use Commonwealth Avenue and Malvern Street to get to West Station to/from the south. Instead of using local streets, buses will use the I-90 ramps and I-90 Main Line to Copley Square to travel between Ruggles Station/LMA and West Station.

The I-90 route is a total of approximately 6.5 miles in length, approximately 3 miles of which are highway/ramp travel and about 3.5 miles of which will be local roadway travel. This is in contrast to the Commonwealth Avenue route, which will only be about 3 miles in length in total (i.e., less than half the I-90 route length). Therefore, travel times between West Station and Ruggles Station will be less than with the I-90 route option, particularly during peak periods, even though the I-90 route includes highway travel. Additionally, the local street route also provides opportunities/flexibility in the future to add stops locally in Brookline or along Commonwealth Avenue if demands warrant it, or if additional stops are desired. The I-90 route does not provide the opportunity/flexibility to add local stops in the future that could benefit the Allston and Brookline communities.



West Station Bus Route Variants

Bus Routing Summary. Of the routing options evaluated for southbound buses leaving West Station, the least disruptive route will be Southbound Bus Route Variant #1 (Malvern Street southbound, to Gardner Street eastbound to Babcock Street southbound to Commonwealth Avenue eastbound). This route appears to be the most favorable because, as compared to the other three southbound route options considered by MassDOT, this route:

- Does not have a significant impact on traffic operations at the Packards Corner
- Does not impact BU property or require easements from the university as the route uses public ways exclusively
- Avoids areas with high pedestrian and bicycle activity in BU's West Campus
- Minimizes disruptions to BU's Traffic Management Plan for events at the Harry Agganis Arena
- Does not require the construction of a new 1,100-foot viaduct structure from the east end of the West Station Busway to Harry Agganis Way/North Service Road
- Is more direct and provides opportunities for intermediate stops between West Station and the LMA/Ruggles Station as compared to the I-90/Copley Square route

More detailed information regarding the analysis of the Transit-Only Option is provided in the *Allston Interchange Traffic Operations Study* (Appendix C).

5.9 Rail Operations

The redevelopment of the Project Area will include some notable changes to the conditions described in Chapter 4, Affected Environment. The areas currently in use for rail operations will continue to be used for rail, with upgrades to modernize the rail yard and construct a new MBTA commuter rail station, West Station, for the 2040 Design Year. The Throat Area Variations will reposition the tracks in the narrow corridor and will provide track crossovers to improve operational flexibility.

This section presents the Project's potential impacts on rail operations. It also presents projected ridership at West Station and assesses transit capacity impacts associated with the No Build and Build Alternatives. Future conditions are presented for the 2025 Opening Year and the 2040 Design Year on Graphics 5.9-1 and 5.9-2, respectively.

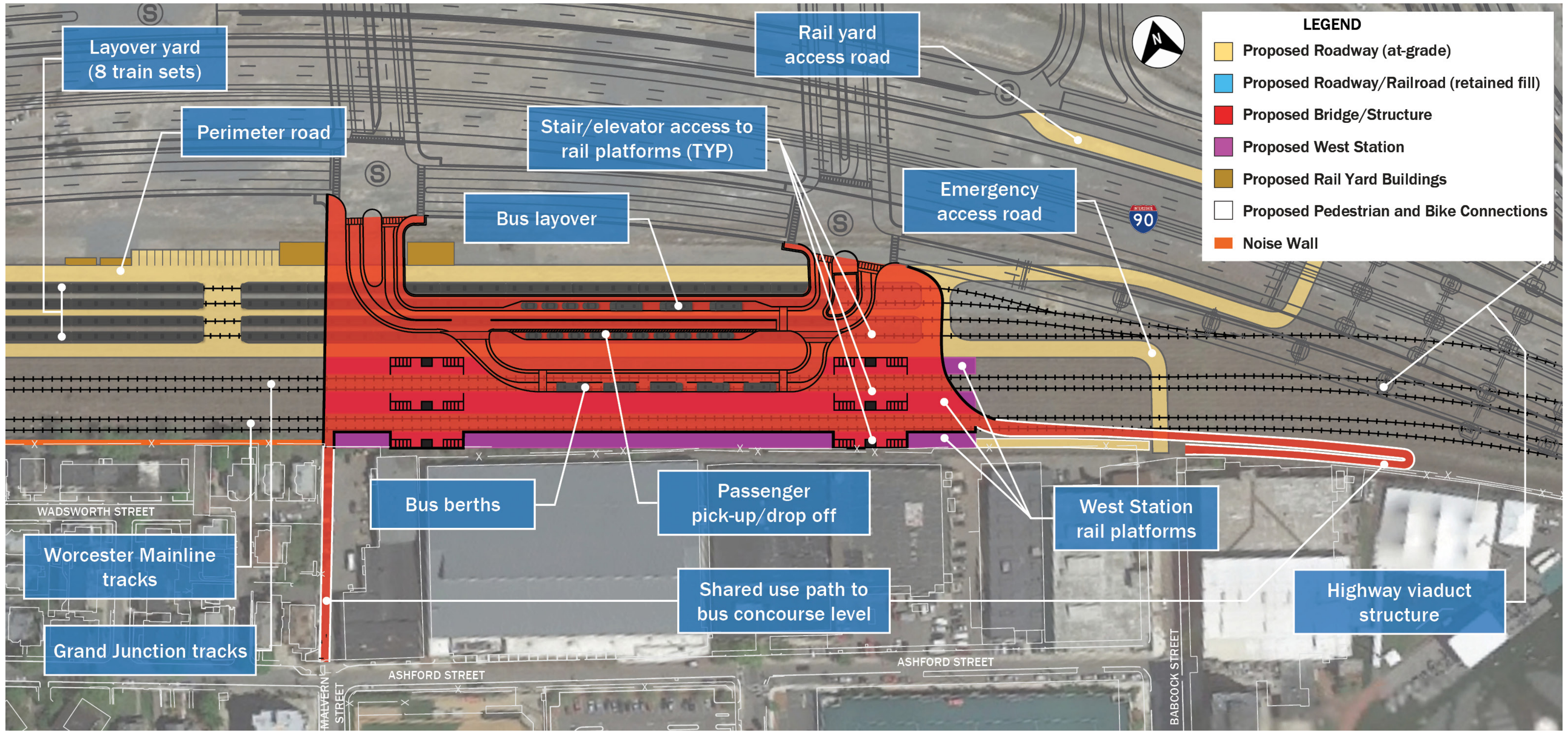
West Station

As described in Chapter 3, the Project will include construction of a new commuter rail station in the 2040 Design Year. The preferred design for the station under 3K-HV and 3K-ABC will include three platforms: one side platform to the south by the most southerly Worcester Main Line train track, one center island platform between the northerly Worcester Main Line track and southerly GJR track, and one side platform to the north of the northerly GJR track. The preferred design for the station under 3K-AMP will include two center island platforms, with GJR tracks occupying the center and the Worcester Main Line tracks to the outside platform edges. The station will also house a multi-modal bus concourse above the train tracks with bus berths, bus layover space, and drop-off/pick-up areas for passenger cars and private shuttles under each variation.

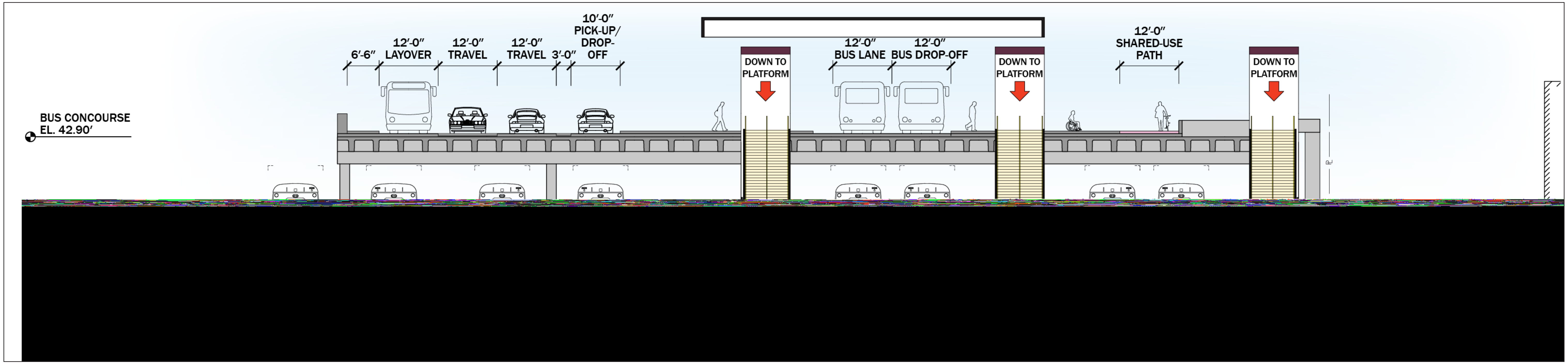
The station will be located on the southern portion of the rail yard along the Worcester Main Line tracks. It will be a stop on the Framingham/Worcester Commuter Rail Line between the Boston Landing Station to the west and the Yawkey Station to the east. The station will be constructed in all Throat Area Variations, but minor details of the station and track design, including the locations of the tracks and layout of connections to the yard tracks, will vary.

Graphic 5.9-3 shows a cross section of West Station and the layover yard, with a three-platform configuration consistent with Variations 3K-HV and 3K-ABC.

Graphic 5.9-1: West Station layout without bus station concourse, 2025


Layover yard
(8 train sets)
Perimeter road
Rail yard
access road
Stair/elevator access to
rail platforms (TYP)
Bus layover
Emergency
access road
LEGEND
🟨 Proposed Roadway (at-grade)
🟦 Proposed Roadway/Railroad (retained fill)
🟥 Proposed Bridge/Structure
🟪 Proposed West Station
🟫 Proposed Rail Yard Buildings
☐ Proposed Pedestrian and Bike Connections
🟧 Noise Wall
90
WADSWORTH STREET
Worcester Mainline
tracks
Grand Junction tracks
Bus berths
Passenger
pick-up/drop off
Shared use path to
bus concourse level
West Station
rail platforms
Highway viaduct
structure
MALVERN STREET
ASHFORD STREET
ASHFORD STREET
BABCOCK STREET

Graphic 5.9-2: West Station layout with bus station concourse, looking east, 2040 Design Year


BUS CONCOURSE
EL. 42.90′
6′-6″
12′-0″ LAYOVER
12′-0″ TRAVEL
12′-0″ TRAVEL
3′-0″
10′-0″ PICK-UP/ DROP-OFF
DOWN TO PLATFORM
12′-0″ BUS LANE
12′-0″ BUS DROP-OFF
DOWN TO PLATFORM
12′-0″ SHARED-USE PATH
DOWN TO PLATFORM

Graphic 5.9-3: Cross Section of West Station and Layover Yard (looking east).

5.9.1 No Build

This section summarizes the impacts of the No Build Alternative on rail operations, including Worcester Main Line operations and rail yard operations.

Rail Yard

The No Build Alternative assumes use of the existing rail yard within the MBTA easement area as defined under an existing easement agreement. Yard operations will include use of four existing tracks included within the MBTA easement area to address existing storage deficiencies. The MBTA easement includes nine total tracks, split between a Main Line easement area and a layover/layup area. The two Worcester Main Line tracks fall within the Main Line easement area, and the remaining seven tracks fall within the layover easement area. Of these seven tracks, per the easement agreement, a maximum of four tracks can be used for layover, provided that train sets within the layover are used daily. Four of the existing tracks provides enough space to store eight train sets[2]. The agreement also allows for the construction of a structure within the layover area to provide shelter for MBTA employees.

Worcester Main Line

The No Build Alternative assumes continued operation of CSX, as well as all MBTA and Amtrak revenue and non-revenue[3] train movements through the Project Area. Non-revenue moves include the transfer of South Side equipment to the Commuter Rail Maintenance Facility for heavy maintenance via GJR, as well as deadhead[4] moves during the day to facilitate revenue services. To evaluate this, MassDOT developed assumptions for 2040 MassDOT New England Regional (Inland) service, CSX train movements, and MBTA and Amtrak revenue and non-revenue train movements.

5.9.2 2025 and 2040 Build

The following sections summarize the impacts of the proposed I-90 Urban Interchange Preferred Alternative on rail operations, including Worcester Main Line operations and yard operations.

Rail Yard

Yard operations, maintenance services and flexibility will be improved under the Preferred Alternative. Improvements include the provision of new tracks, new turnouts, welded rail[5], power plug-ins and facilitation of servicing. Track reconstruction will provide a better track surface and layout for train sets to access the layover yard for minor maintenance activities, such as fueling and cleaning, and will allow for the installation of welded rail. Replacement of the existing turnouts to/from the yard with welded rail will reduce noise from passing train sets. Noise and vibration impacts from the Project are discussed further in Section 5.11.

In the 2025 Opening Year, the rail yard will consist of a total of four layover tracks storing up to eight train sets. The four existing layover tracks will be reconstructed and realigned to widen the space between layover tracks to improve access for light maintenance. Sometime thereafter, but before 2040, MassDOT will construct an additional four permanent layover tracks to the north of the MBTA easement area. The existing yard ladder to the east will be rebuilt to provide access and to connect to the realignment of Main Line tracks and GJR.

In the 2040 Design Year, the four original storage tracks will be removed to allow for the construction of West Station. The rail yard will retain the four permanent storage tracks, allowing total midday rail yard storage for up total of eight train sets.

The expanded yard storage option, which utilizes temporary storage tracks in addition to the permanent storage tracks, is only possible with the 3K-HV and 3K-ABC Variations. The 3K-AMP Variation precludes the temporary layover due to the proposed Worcester Main Line and GJR track configuration, which will require realignment of the Main Line track to the north to make room for the railroad viaduct structure to descend to grade within the station area. The location of the GJR retained earth structure and the realigned Main Line track to the north will proceed through the area where the temporary and existing storage tracks will be sited.

Worcester Main Line

The Preferred Alternative will accommodate railroad operations for CSX train movements and all MBTA and Amtrak revenue and non-revenue train movements through the Project Area. The Worcester Main Line will also have better capacity to support future MassDOT New England Regional (Inland) service, as well as expanded MBTA and Amtrak revenue train movements.

Operating schedules will also include rail service to the West Station commuter rail station. In accordance with the MBTA's *Service Delivery Policy*[6], a minimum of three peak period trains in the peak direction and 180 minute headways[7] during off-peak periods were assumed at West Station.

Rail operations and flexibility will be improved under the Preferred Alternative, with the addition of two GJR tracks that will also serve as Main Line siding tracks[8] and upgrades to the Control Point (CP)3 and CP4 interlockings[9]. The additional siding tracks will extend from the eastern Project Area limits near the Commonwealth Avenue Bridge to the new Boston Landing Station to the west. These tracks offer operational flexibility for all services along the Worcester Main Line by reducing the number of operational conflicts, providing passing sidings for the different services operating along the corridor, and allowing for growth of services along the Worcester Main Line. These tracks will also provide additional operational flexibility within West Station by allowing for a variety of stopping patterns for Worcester Line rail services. Additionally, the proposed track configuration will not preclude the ability for future revenue services to utilize the GJR tracks.

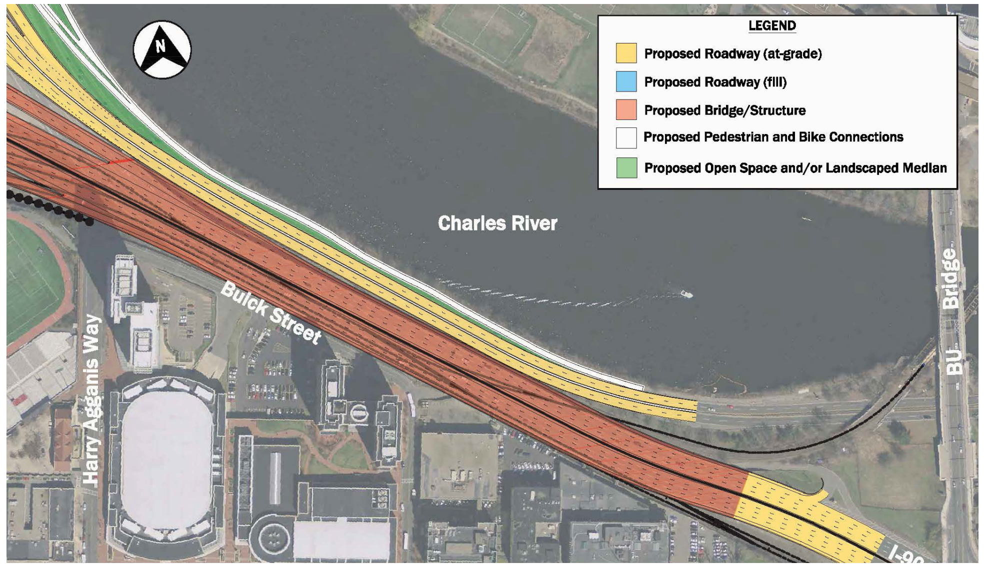
In order to properly use the siding tracks, infrastructure upgrades will be made for the CP3 and CP4 interlockings to provide optimal flexibility between all four revenue tracks. The proposed CP4 track configuration is identical for each Throat Area Variation. The proposed CP3 interlocking upgrades are different in the Throat Area Variations, as discussed below.

Freight operations will be similarly affected under the Preferred Alternative. Houghton Chemical, which receives a few deliveries per week from CSX via rail, will terminate its service before the Project begins construction. CSX will maintain perpetual operation rights through the yard, through the station area, and across GJR. The proposed siding tracks will provide the opportunity to separate freight movements from passenger movements on the Main Line tracks and to connect to the freight siding constructed as a part of the Boston Landing Station. The additional tracks will also provide for more flexible connections to and across GJR, depending on the Throat Area Variation.

Throat Area Variations

3K-HV Variation

The 3K-HV Variation will locate the rail infrastructure at grade. The highway will be located over the tracks on a viaduct, as illustrated on Graphic 5.9-4. This configuration will be consistent with the existing layout for the highway and rail. It will also provide adequate space for both elements within the existing footprint. This space will add two new tracks that will provide more flexible connections to GJR. Improved operational flexibility will be accomplished with the expansion and relocation of the existing CP3 interlocking, and by the addition of new track switches that will allow trains to move between tracks. Currently, there are two crossovers[10] located underneath the Commonwealth Avenue bridge that provide universal access between the two existing Worcester Main Line tracks, but no connection to the GJR. By upgrading and relocating these crossovers farther west into the Throat Area, the two additional GJR tracks will better connect and integrate into the overall rail system and provide for a more efficient operation. Additionally, this configuration provides the most efficient use of physical space to fit crossovers between the Worcester Main Line and GJR, and between the two GJR tracks, to provide east side access to the proposed yard.


N
LEGEND
🟨 Proposed Roadway (at-grade)
🟦 Proposed Roadway (fill)
🟥 Proposed Bridge/Structure
☐ Proposed Pedestrian and Bike Connections
🟩 Proposed Open Space and/or Landscaped Median
Charles River
Buick Street
Harry Agganis Way
BU Bridge
I-90

Graphic 5.9-4: 3K-HV Throat Area Variation

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[2] Assumes train sets are comprised of nine coaches and one locomotive.

[3] Revenue train movements refer to train trips that carry passengers between service stations. Non-revenue is a railroad industry term used to describe the movement of equipment and/or crews between locations when trains are not in revenue service (such as to and from layover).

[4] Deadhead describes non-revenue train movements without passengers.

[5] Welded rail provides for a more comfortable and quieter ride, and would also reduce noise impacts of the yard.

[6] Massachusetts Bay Transportation Authority. Service Delivery Policy. June 2, 2010. www.mbta.com

[7] Headway refers to the time interval between vehicle trips provided in a transit system.

[8] A siding track is a shorter section of track, distinct from a through route such as a Main Line, which may connect to through track or to other siding tracks at either end. Siding tracks are used to enable trains on he same line to pass each other.

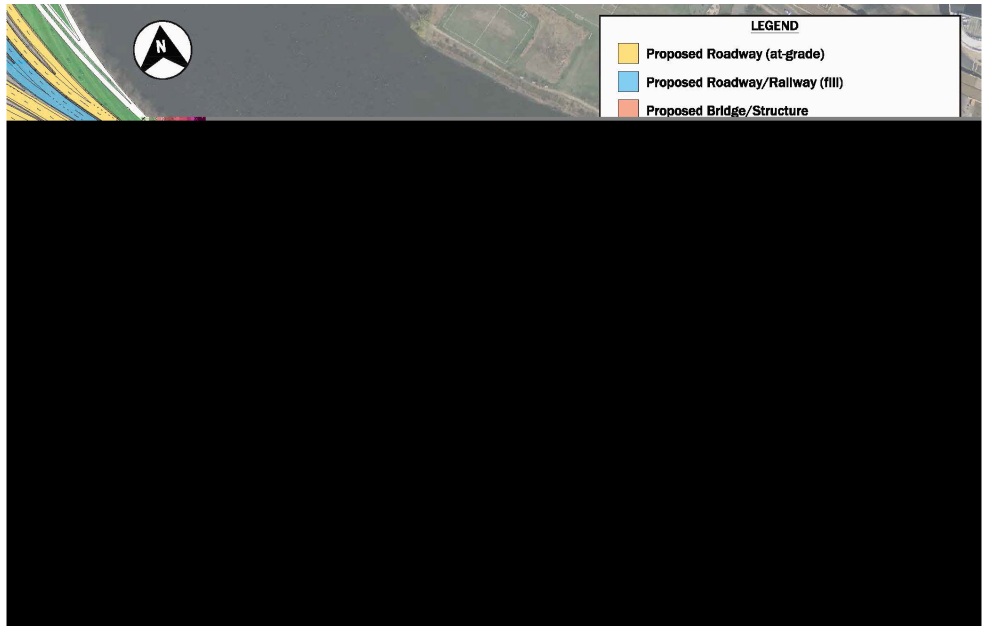
[9] An interlocking is a segment of railroad infrastructure comprised of track, turnouts, and signals linked (interlocked) in a way that allows trains to safely move from one track to another, or across tracks, preventing conflicting train movements.

[10] A crossover is an arrangement of railroad track infrastructure that joins two parallel track, enabling a train to be diverted from one track to another.

The 3K-HV Variation track configuration will enable non-revenue train movements to/from the yard to clear the Main Line via the GJR tracks, providing for less conflicts and delays to revenue service. While this layout will provide for two GJR tracks within the Throat Area, it will also connect the two into a single track before the GJR bridge over SFR. The 3K-HV Variation will not require the GJR bridge over SFR to be rebuilt; it will also not preclude future bridge reconstruction and a second track over the bridge.

3K-AMP Variation

The 3K-AMP Variation will locate the highway at grade/below grade adjacent to the Worcester Main Line tracks, and elevate GJR over the highway. This stacked configuration, illustrated on Graphic 5.9-5, is the opposite of the existing configuration.


LEGEND
Proposed Roadway (at-grade)
Proposed Roadway/Railway (fill)
Proposed Bridge/Structure

[redacted]

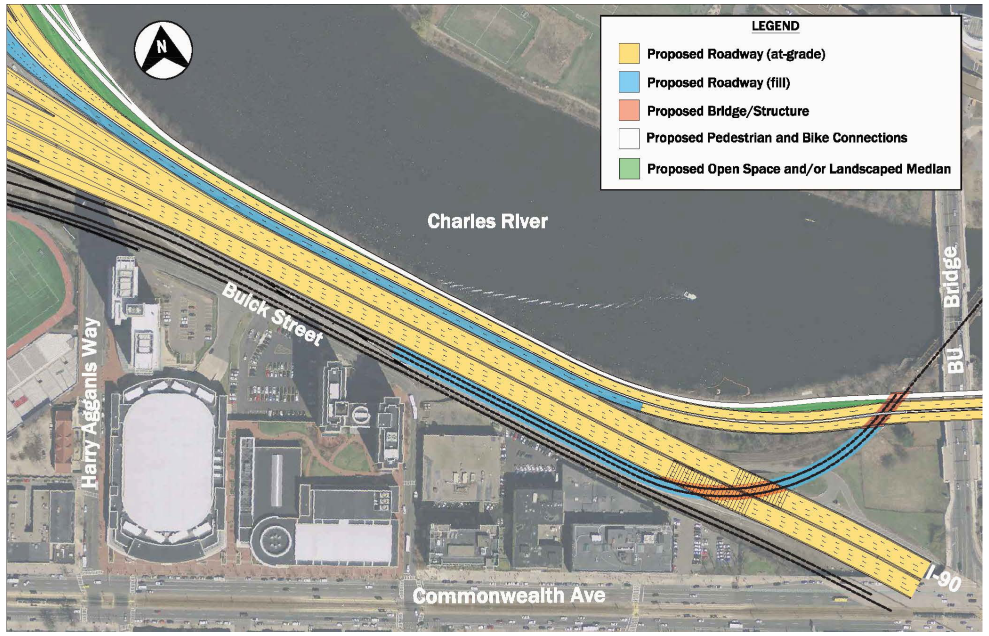
Graphic 5.9-5: 3K-AMP Throat Area Variation

It encroaches onto BU property by approximately 7 feet, where parking, a parking structure, steam piping, and a building fire escape exist. More detailed building investigations will be necessary to make certain that the building impacts being described are not more extensive than planned, thus requiring additional building demolition and/or retrofit. This layout will not provide connections between the Worcester Main Line tracks and the GJR tracks due to their separated grades. The new crossovers that will replace the CP3 interlocking will be shifted farther west and will provide faster connections only between the Worcester Main Line tracks. The lack of a connection between the Worcester Main Line tracks and the GJR tracks will reduce operational flexibility, compared with the 3K-HV Throat Area Variation. It will require that both crossovers between the two branches only be constructed to the west of the proposed West Station (in the CP4 interlocking). This configuration will force all freight trains and MBTA non-revenue service moves destined for GJR through the station area. Special platform edge treatments, or additional trackwork segments, will be required to support wider freight clearances through the station platform area. This configuration will require all movements into and out of the yard to go directly onto one of the Worcester Main Line tracks and occupy track time, potentially delaying revenue services. A broken-back curve on Track 1 will require slower train operating speeds. The separation of the Worcester Main Line tracks from the GJR tracks will also complicate operations at the station. Under this variation, the GJR tracks will be located between the Worcester Main Line tracks, splitting the Main Line tracks to the outside of the platforms. This will cause westbound Main Line services on the northernmost track to use the crossovers in CP4 to get back to the Main Line locations at Boston Landing Station. The need to use crossovers will result in reduced train speeds through the area west of West Station and will slow down any express services not stopping at West Station. The separated GJR tracks on the viaduct as a two-track alignment will also require rebuilding the bridge over SFR. In addition, the Worcester Main Line outbound track will contain a broken-back curve just east of West Station with a maximum train speed of 35 mph in this area.

3K-ABC Variation

The 3K-ABC Variation, illustrated on Graphic 5.9-6, will locate the highway at grade/below grade adjacent to the Worcester Main Line tracks and GJR. Towards the eastern limits of the Throat Area, the GJR tracks will rise on retained fill, cross over the highway on an elevated bridge structure, and meet the existing track alignment on the bridge over the Charles River. This layout will also encroach onto BU property by approximately 7 feet, where parking, a parking structure, steam piping, and a building fire escape exist. More detailed building investigations will be necessary to make certain that the building impacts being described are not more extensive than planned, thus requiring additional building demolition and/or retrofit.

The layout will expand the existing CP3 interlocking west to better connect the Worcester Main Line track and the GJR track, and provide better connections between the GJR tracks than the existing condition. While similar to the 3K-HV Throat Area Variation in providing crossovers between tracks within the Throat Area, the crossovers are not optimal. All crossovers between the Worcester Main Line tracks and the GJR must occur to the west of the structures carrying the GJR over I-90. The limited horizontal space available means that the distance between successive crossovers is less than the length of a train, which could lead to operational delays. The proposed double track section of the GJR will require the reconstruction of the SFR bridge to accommodate both tracks and will impact BU property.


N
LEGEND
Proposed Roadway (at-grade)
Proposed Roadway (fill)
Proposed Bridge/Structure
Proposed Pedestrian and Bike Connections
Proposed Open Space and/or Landscaped Median
Charles River
Buick Street
Harry Agganis Way
BU Bridge
Commonwealth Ave
I-90

Graphic 5.9-6: 3K-ABC Throat Area Variation.

Table 5.9-1 summarizes the rail operations differences in the three Throat Area Variations.

Table 5.9-1: Rail Operations Differences within Throat Area Variations

Throat Area Variation	Rail Component
3K-HV Variation	- Maintains all rail infrastructure at-grade - Retains Main Line track geometry consistent with current maximum authorized speeds - Switches and crossovers provide flexible connections to the GJR - Expands and relocates existing CP3 interlocking and increases operational efficiency - Upgrades and relocates two existing crossovers beneath Commonwealth Avenue bridge - Supports two GJR tracks and improved integration into the overall rail system - Enables non-revenue train movements to/from the yard to clear the Main Line, providing for less conflicts and delays to revenue service - Allows for two GJR tracks that will be connected into a single track before the Grand Junction Bridge over SFR - Does not require the GJR bridge over SFR to be rebuilt
3K-AMP Variation	- Maintains Worcester Main Line tracks at-grade - Limits train speeds due to the constrained track geometry - Alters Main Line track geometry and will reduce maximum authorized speed of outbound track - Elevates GJR on a viaduct over the highway - Allows for a western connection between Worcester Main Line tracks and between two GJR tracks - Does not allow connections between the Main Line and GJR due to separated grades - Provides new crossovers between the Worcester Mainline tracks - Requires all freight movements on the GJR to pass through West Station - Requires special platform edge treatments to support wider freight clearances through the station platform area - Precludes a direct connection between the rail yard and GJR - Requires all movements into and out of the yard go directly onto one of the Worcester Main Line tracks - Encroaches onto adjacent BU property that includes existing parking, a parking structure, steam piping, and a fire escape - GJR tracks on the viaduct will require that the bridge over SFR be rebuilt to accommodate the approach alignment - Requires all MBTA non-revenue movements between the South Side and North Side system to pass through West Station twice for each directional movement
3K-ABC Variation	- Maintains Worcester Main Line tracks and GJR mostly at grade with the Throat Area - Retains Main Line track geometry consistent with current maximum authorized speed - Locates GJR tracks on retained fill to cross over the highway on an elevated bridge structure and meets the existing track alignment at the bridge over the Charles River - Encroaches onto BU property that includes existing parking, a parking structure, steam piping and a fire escape - Requires expansion of the existing CP3 interlocking west to connect the Worcester Main Line track and the GJR track - Requires the reconstruction of the SFR bridge to accommodate both tracks - Provides for yard access from the northernmost GJR track, which will provide for non-revenue train movements to/from the yard without impact to Worcester Main Line operations - Requires non-revenue trains to occupy the GJR tracks before entering and exiting the yard, adding a constraint to GJR rail operations

West Station

This section summarizes future rail operations at West Station. The station will be located on the Worcester Main Line, with two or three platforms situated between the extended limits of Malvern Street and Babcock Street, along the southern property limits of the Project Area, as illustrated on Graphic 5.9-1 through 5.9.3. The station will be centrally located between the Boston Landing and Yawkey Stations, allowing trains to accelerate efficiently between them. Additionally, the use of Malvern and Babcock Streets to bookend the platform limits will provide for optimal pedestrian and bicycle connections between the station and the surrounding street network. Under 3K-HV and 3K-ABC, the platform configuration will provide direct walk-up access to the southernmost platform, abutting the southern property line. Walk-up access will not be available to the platforms under 3K-AMP. The proposed track and platform layout will also provide for cross platform transfers between Worcester Main Line services and any future GJR services.

West Station will have an elevated bus loop above the passenger platforms to enable multi-modal station access for buses, vehicles, bicyclists and pedestrians. The bus loop will connect to the proposed roadway network to the north, enabling vehicle (including private vehicles and taxis) and bus access. The bus loop will provide curbside bus berths (for passenger pick up and drop off), curbside bus layover, and curbside passenger pick up and drop off through a two way loop, with entrances available from either end of the station. The bus loop level of the station will provide two stairway and elevator access routes to each of the three passenger platforms below. Additional information on the development and features of the bus loop is provided in Appendix A, Rail Yard and Station Alternatives Analysis Technical Appendix. Pedestrians and cyclists will access the station from the south through entrances at Babcock Street and Malvern Street, and from the north via the new roadway network. Bicycle and pedestrian access is discussed in further detail in Section 5.7.

Summary

The Project will have an overall positive impact on railroad operations for all services along the Worcester Main Line and within the West Station area, allowing flexibility for future rail services and growth along the corridor. Yard operations, limited maintenance accommodations, and flexibility will be improved with the Build Alternative. The Project infrastructure will not preclude future service connections between West Station and Cambridge via GJR.

5.9.3 Ridership and Transit Capacity

This section presents projected ridership at the proposed West Station and assesses transit capacity impacts associated with the No Build and Build Alternatives. Future conditions are presented for the 2025 Opening Year and the 2040 Design Year. Additional information, including details of the methodology and assumptions used to develop ridership data, is provided in the Ridership Forecasting Technical Report in Appendix L.

Key Assumptions

CTPS developed ridership projections and transit vehicle loading forecasts to assess the impacts of the Build Alternatives using the CTPS regional travel demand model. The model scenarios included 2025 Opening Year and 2040 Design Year alternatives, for both No Build and Build conditions.

The 2040 travel demand forecasts provided by CTPS assume the implementation of several transportation projects by 2040, consistent with the currently adopted Long-Range Transportation Plan (LRTP) of the Boston Region Metropolitan Planning Organization (MPO), *Charting Progress to 2040* (2015). For a full listing of the transit-related projects in the region included in the CTPS model for the 2040 Design Year, please see the CTPS Transit Network Assumption Memorandum in Appendix C. Future improvements likely to have the greatest influence within or adjacent to the Project Area include:

- Increased service on the Worcester Main Line
- Green Line extension to College Avenue and Union Square in Somerville

The 2040 No Build Alternative does not include West Station. Also, no significant changes in MBTA bus services within, or adjacent to, the Project Area are expected to occur by 2040 in the No Build Alternative.

The 2040 Build Alternatives assume the opening of West Station, a new stop on the MBTA's Worcester Line commuter rail service. MassDOT developed a proposed commuter rail schedule that meets the MBTA's Service Delivery Policy of providing at least three morning and three afternoon peak period, peak direction train stops at West Station. The MBTA's service policy also includes provision of 180-minute headways at a minimum during off-peak periods. The proposed Worcester Line schedule is included in the CTPS Transit Network Assumption Memorandum in Appendix C. It assumes that some Worcester Line trains will stop at the new Boston Landing Station as well as at West Station. Several commuter rail peak period trains will run express through both stations. Urban Rail train service was not incorporated within the ridership model horizon, because a future build year has not been determined and service frequency has not been defined.

The 2040 Build model scenarios tested various interchange and roadway network options, including the base interchange alternative, an interchange alternative that includes an alternative that restricts portions of Stadium Way for transit vehicles only (southbound between Western Avenue and Cambridge Street South) and the interchange alternative that includes a roadway connection to Commonwealth Avenue as discussed in Section 5.8).

Bus service to West Station was also modeled, including the addition of new shuttle lines assumed to be operating in the Project Area. The shuttle bus assumptions incorporated into the CTPS model vary depending on the modeled scenario, as follows:

- In the 2025 No Build, 2025 Build and 2040 No Build Alternatives, one new shuttle bus route between Harvard Square and Barry's Corner in Allston was assumed to operate at 10-minute headways during the daytime and 20-minute headways during the Night Period.
- In the 2040 Build base interchange alternative and the alternative with transit restrictions on Stadium Way, three new shuttle routes were assumed, including:
  - One new Harvard Shuttle route between Harvard Square and West Station, operating at 5-minute headways during the AM and PM peak periods, 15-minute headways during the midday period and 20-minute headways during the night period.
  - One new Kendall Shuttle route between Kendall Square and West Station via Central Square, operating at 5-minute headways during the AM and PM peak periods, 15-minute headways during the midday and 20-minute headways during the night period.
  - One new LMA Shuttle route between Ruggles Station and West Station via the Longwood Medical Area, operating at 5-minute headways during the AM and PM peak periods, 15-minute headways during the midday and 20-minute headways during the night period.
- In the 2040 interchange alternative with a new roadway connection to Commonwealth Avenue, (as described in Section 5.8), two new shuttle routes were assumed:
  - One new Harvard Shuttle route between Harvard Square and West Station, operating at 5-minute headways during the AM and PM peak periods, 15-minute headways during the midday and 20-minute headways during the night period.
  - One new Kendall-LMA Shuttle between Kendall Square and Ruggles Station via West Station and the Longwood Medical Area, operating at 5-minute headways during the AM and PM peak periods, 15-minute headways during the midday and 20-minute headways during the night period.

Bus destinations and headways used in the CTPS model were developed based on coordination between CTPS, MassDOT and Harvard University. The operator for these shuttle routes is not determined at this time, and would be operated by the MBTA or by others. The model included minor diversions of the existing MBTA bus routes #64 and #66 in the vicinity of West Station, but did not consider potential stops by intercity buses travelling via I-90 to the South Station bus terminal. The model also excluded construction of any parking facilities at or near the station. Curbside taxi and "kiss-and-ride" drop-off accommodations at West Station were included in the model.

The CTPS ridership model assumed that land development within the Project vicinity would amount to approximately 7 million square feet. For the purposes of the CTPS modeling, the Project vicinity includes the BPY, the Harvard University Enterprise Zone, the Harvard Business School area and the Harvard athletic fields/recreational area (CTPS TAZs 238, 244, 245 and 246). More details on the land use assumptions used to develop ridership data are contained in Appendix L, Ridership Forecasting Technical Report.

5.9.3-1 Ridership

Given the inputs and modeling assumptions described above, as well as the roadway networks developed for the modeled scenarios, the daily commuter rail and bus shuttle ridership at West Station was projected for the 2040 Design Year alternative, as summarized in Table 5.9-2. In the 2040 Design Year, daily commuter rail ridership at West Station is projected to total approximately 220 to 270 boardings, depending on the roadway network option.

As compared to the commuter rail projections, a substantially higher number of bus shuttle boardings are projected at West Station, ranging from approximately 650 to 2,300 daily boardings, depending on the roadway network option. (Boardings refer to the entry of passengers.) The 2040 alternative resulting in the highest number of daily transit boardings at West Station was found to be the option with transit restrictions on Stadium Way, which was forecast to have 270 commuter rail boardings and 2,300 bus shuttle boardings for a total of 2,570 transit boardings at the station. However, this is only 70 total boardings more (+ 2.8%) than the base interchange alternative which is projected to have 2,500 total boardings and does not include user restrictions on Stadium Way southbound.

The design of the West Station platforms, access loop, and circulation areas will be sized to adequately accommodate pedestrian flows associated with the ridership estimates for the facility

Table 5.9-2: Daily West Station Ridership Projections Summary

	DAILY BOARDINGS		
	2040 BUILD	2040 BUILD W/ COMM AVE CONNECTION	2040 BUILD W/ STADIUM WAY TRANSIT-ONLY SB
West Station (Commuter Rail)	250	220	270
West Station (All Shuttles)	2,250	650	2,300
West Station Total	**2,500**	**870**	**2,570**

Source: CTPS, Transit Results (see Appendix L). Results rounded to nearest 10.

Table 5.9-3 summarizes the ridership projections for the commuter rail stations, MBTA bus routes, and other bus shuttle routes in the Study Area under each analyzed network option. It is notable that once West Station is opened in 2040, projected demand at Boston Landing Station is expected to decrease, suggesting that some Boston Landing riders will divert to West Station. Together, the two stops offer an approximate doubling of total ridership from the 2040 No Build Boston Landing demand (200 daily boardings) to the combined 2040 Build Boston Landing/West Station demand (380 to 430 daily boardings, depending on the network option). However, the combined ridership for the two stations is anticipated to be much lower than the combined demand projected at the three Newton stations (Auburndale, West Newton and Newtonville).

Table 5.9-3: Daily Transit Ridership Projections Summary

	DAILY BOARDINGS						
	2012	2025 NB	2025 BUILD	2040 NB	2040 BUILD	2040 BUILD W/ COMM AVE CONNECTION	2040 BUILD W/ STADIUM WAY TRANSIT-ONLY SB
MBTA Commuter Rail							
Auburndale Station [a]	180	230	240	220	240	240	240
West Newton Station [a]	170	320	330	300	360	360	360
Newtonville Station [a]	290	400	410	400	450	430	450
Boston Landing Station [a]	-	180	190	200	160	160	160
West Station (Commuter Rail) [a]	**-**	**-**	**-**	**-**	**250**	**220**	**270**
Yawkey Station [a]	360	1,100	1,110	1,160	1,150	1,170	1,150
MBTA Bus							
Route 57/57A (All Stops) [b]	10,100	18,200	18,100	20,300	20,400	20,600	20,400
Route 64 (All Stops) [b]	2,000	2,400	2,100	2,800	2,500	2,500	2,500
Route 66 (All Stops) [b]	13,900	18,000	16,600	20,300	17,200	17,700	18,800
Other Bus Shuttles							
Harvard – Barry's Corner Shuttle (All Stops) [b]	-	800	800	-	-	-	-
Harvard Shuttle (All Stops) [b]	-	-	-	-	800	700	1,000
Kendall Shuttle (All Stops) [b]	-	-	-	-	900	-	1,000
LMA Shuttle (All Stops) [b]	-	-	-	-	3,200	-	3,200
Kendall - LMA Shuttle (All Stops) [b]	-	-	-	-	-	1,100	-
West Station (All Shuttles) [a]	**-**	**-**	**-**	**-**	**2,250**	**650**	**2,300**
West Station Total [a]	**-**	**-**	**-**	**-**	**2,500**	**870**	**2,570**

Source: CTPS, Transit Results (see Appendix L). a Results rounded to nearest 10. b Results rounded to nearest 100.

5.9.3.2 Transit Capacity

This section summarizes the potential impacts of the ridership forecasts from the Build Alternatives on the future capacity on the MBTA's commuter rail, rapid transit, and local bus routes operating in the vicinity of the Project. Projected ridership demands were compared to available vehicle capacities as identified by the *MBTA's Service Delivery Policy,*[11] which defines levels of crowding that are acceptable by time period and mode of transportation. Details of the methodology and results are provided in Appendix L, Ridership Forecasting Technical Report.

Table 5.9-4 and Table 5.9-5 summarize the results of the 2025 Opening Year transit vehicle loading analysis for the AM and PM peak hours, respectively. Results for the 2040 Design Year transit vehicle loading analysis for the AM and PM peak hours, respectively, are summarized in Table 5.9-6 and Table 5.9-7.

Table 5.9-4: 2025 Opening Year Vehicle Loading Summary for AM Peak Hour

SERVICE AND DIRECTION	VOLUME/ POLICY CAPACITY	
	2025 NB	2025 BUILD
Worcester/Framingham Commuter Rail Line IB[a]	0.67	0.67
Worcester/Framingham Commuter Rail Line OB[a]	0.17	0.17
Green Line B Branch IB[a] - Aboveground	**1.03**	**1.03**
Green Line B Branch OB[a] - Aboveground	0.52	0.53
Green Line B Branch IB[a] - Underground (Central Subway)	0.30	0.30
Green Line B Branch OB[a] - Underground (Central Subway)	0.48	0.48
Local Bus Route 66 IB[a]	**1.21**	**1.16**
Local Bus Route 66 OB[a]	0.52	0.44
Local Bus Route 64 IB[a]	0.77	0.71
Local Bus Route 64 OB[a]	0.77	0.73
Local Bus Route 70/70A IB[a]	0.78	0.83
Local Bus Route 70/70A OB[a]	0.92	0.91
Local Bus Route 57/57A IB[a]	0.67	0.67
Local Bus Route 57/57A OB[a]	0.85	0.87
Harvard – Barry's Corner Shuttle Bus	0.09	0.09

Source: CTPS, Transit Crowding Analysis (see Appendix L). a IB = inbound; OB = outbound.

Table 5.9-5: 2025 Opening Year Vehicle Loading Summary for PM Peak Hour

SERVICE AND DIRECTION	VOLUME/ POLICY CAPACITY	
	2025 NB	2025 BUILD
Worcester/Framingham Commuter Rail Line IB[a]	0.23	0.23
Worcester/Framingham Commuter Rail Line OB[a]	0.52	0.52
Green Line B Branch IB[a] - Aboveground	0.53	0.54
Green Line B Branch OB[a] - Aboveground	0.80	0.80
Green Line B Branch IB[a] - Underground (Central Subway)	0.29	0.29
Green Line B Branch OB[a] - Underground (Central Subway)	0.31	0.31
Local Bus Route 66 IB[a]	0.60	0.58
Local Bus Route 66 OB[a]	0.58	0.54
Local Bus Route 64 IB[a]	**2.28**	**2.14**
Local Bus Route 64 OB[a]	**1.10**	0.94
Local Bus Route 70/70A IB[a]	0.93	0.96
Local Bus Route 70/70A OB[a]	0.50	0.50
Local Bus Route 57/57A IB[a]	0.45	0.43
Local Bus Route 57/57A OB[a]	0.73	0.73
Harvard – Barry's Corner Shuttle Bus	0.45	0.43

Source: CTPS, Transit Crowding Analysis (see Appendix L). a IB = inbound; OB = outbound.

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[11] Massachusetts Bay Transportation Authority. Service Delivery Policy. June 2, 2010. www.mbta.com

Table 5.9-6: 2040 Design Year Vehicle Loading Summary for AM Peak Hour

SERVICE AND DIRECTION	VOLUME/ POLICY CAPACITY			
	2040 NB	2040 BUILD	2040 BUILD W/ COMM AVE CONNECTION	2040 BUILD W/ STADIUM WAY TRANSIT-ONLY SB
Worcester/Framingham Commuter Rail Line IB[a]	0.75	0.75	0.74	0.75
Worcester/Framingham Commuter Rail Line OB[a]	0.20	0.20	0.20	0.20
Green Line B Branch IB[a] - Aboveground	1.14	1.12	1.15	1.12
Green Line B Branch OB[a] - Aboveground	0.56	0.60	0.61	0.60
Green Line B Branch IB[a] - Underground (Central Subway)	0.33	0.33	0.33	0.33
Green Line B Branch OB[a] - Underground (Central Subway)	0.50	0.49	0.51	0.51
Local Bus Route 66 IB[a]	1.38	1.10	1.29	1.10
Local Bus Route 66 OB[a]	0.62	0.51	0.52	0.51
Local Bus Route 64 IB[a]	0.99	0.81	0.84	0.81
Local Bus Route 64 OB[a]	0.96	0.87	0.82	0.87
Local Bus Route 70/70A IB[a]	0.86	0.91	0.87	0.91
Local Bus Route 70/70A OB[a]	1.04	0.87	1.04	0.86
Local Bus Route 57/57A IB[a]	0.81	0.78	0.77	0.78
Local Bus Route 57/57A OB[a]	0.99	0.93	0.91	0.93
Harvard Shuttle Bus IB[a]	-	0.05	0.05	0.09
Harvard Shuttle Bus OB[a]	-	0.09	0.09	0.09
Kendall Shuttle Bus IB[a]	-	0.26	-	0.26
Kendall Shuttle Bus OB[a]	-	0.06	-	0.02
LMA Shuttle Bus IB[a]	-	0.70	-	0.72
LMA Shuttle Bus OB[a]	-	0.14	-	0.14
West Station-LMA-Kendall Shuttle Bus IB[a]	-	-	0.15	-
Kendall-LMA-West Station Shuttle Bus OB[a]	-	-	0.07	-

Source: CTPS, Transit Crowding Analysis (see Appendix L). a IB = inbound; OB = outbound. Volume-to-capacity (V/C) ratios greater than 1.0 indicate that the average demand during the peak hour would exceed available capacity as defined by the MBTA's Service Delivery Policy.

In 2025, the Build Alternative will not result in crowding impacts to commuter rail, rapid transit, local bus or bus shuttle routes that will exceed the MBTA's Service Delivery Policy maximum load that will be greater than the impacts anticipated in the No Build Alternative. In the 2025 Opening Year No Build Alternative and Build Alternative, loading on the MBTA's surface Green Line B Branch and Route 66 are projected to exceed Service Delivery Policy capacity in the inbound direction during the AM peak hour. During the PM peak hour, loading on the MBTA's Route 64 is projected to exceed Service Delivery Policy capacity in the inbound direction in both the 2025 No Build and Build scenarios. In all of these cases, overcrowding is projected in the No Build Alternative and is not a result of the Project. **There will be no additional impacts to passenger crowding in the 2025 Opening Year as a result of the Project.**

In the 2040 Design Year, the Build Alternative will not result in crowding impacts to commuter rail, rapid transit, local bus or bus shuttle routes that will exceed the MBTA's Service Delivery Policy maximum load that will be greater than the impacts anticipated to occur in the No Build Alternative. During the AM peak hour, projected growth will result in passenger crowding on the MBTA's surface Green Line B Branch (inbound), Route 66 (inbound) and Route 70/70A (outbound) under the No Build Alternative. Passenger crowding on the MBTA's surface Green Line B Branch (inbound), Route 66 (inbound) and Route 70/70A (outbound) in the 2040 Build Alternatives will be approximately equal to or less than overcrowding anticipated in the No Build Alternative. During the PM Peak Hour, growth in the No Build Alternative will result in passenger crowding on the MBTA's Route 64 (inbound and outbound), and Route 70/70A (inbound).

In the Build Alternatives, passenger crowding on the Route 64 will be less than the overcrowding anticipated in the No Build Alternative. On the Route 70/70A, passenger crowding during the PM peak hour in the Build Alternatives will be slightly higher than crowding anticipated in the No Build Alternative, exceeding capacity by approximately 5-6% as compared to 1% in the No Build Alternative. However, in both the No Build and Build Alternatives, projected overcrowding on the Route 70/70A that will exceed the MBTA's Service Delivery Policy maximum load is due to growth in the No Build Alternative, and is not a result of Project.

5.9.4 Summary

Ridership

The Project will result in approximately 220 to 270 daily commuter rail boardings at West Station in the 2040 Design Year, depending on the selected roadway network option. As compared to the commuter rail projections, a substantially higher number of bus shuttle boardings are projected at West Station, ranging from approximately 650 to 2,300 daily boardings, depending on the roadway network option.

West Station will divert some ridership from Boston Landing Station. Together, the two stops offer an approximate doubling of total ridership from the 2040 No Build Boston Landing demand (200 daily boardings) to the combined 2040 Build Boston Landing /West Station demand (380 to 430 daily boardings, depending on the roadway network option).

Table 5.9-7: 2040 Design Year Vehicle Loading Summary for PM Peak Hour

SERVICE AND DIRECTION	VOLUME/ POLICY CAPACITY			
	2040 NB	2040 BUILD	2040 BUILD W/ COMM AVE CONNECTION	2040 BUILD W/ STADIUM WAY TRANSIT-ONLY SB
Worcester/Framingham Commuter Rail Line IB[a]	0.27	0.27	0.16	0.27
Worcester/Framingham Commuter Rail Line OB[a]	0.56	0.59	0.58	0.59
Green Line B Branch IB[a] - Aboveground	0.56	0.59	0.60	0.59
Green Line B Branch OB[a] - Aboveground	0.87	0.88	0.89	0.87
Green Line B Branch IB[a] - Underground (Central Subway)	0.31	0.31	0.31	0.31
Green Line B Branch OB[a] - Underground (Central Subway)	0.31	0.31	0.31	0.31
Local Bus Route 66 IB[a]	0.69	0.56	0.62	0.55
Local Bus Route 66 OB[a]	0.64	0.50	0.55	0.50
Local Bus Route 64 IB[a]	**2.70**	**2.47**	**2.47**	**2.42**
Local Bus Route 64 OB[a]	**1.31**	**1.10**	**1.15**	**1.10**
Local Bus Route 70/70A IB[a]	**1.01**	**1.06**	**1.05**	**1.06**
Local Bus Route 70/70A OB[a]	0.55	0.55	0.55	0.55
Local Bus Route 57/57A IB[a]	0.56	0.48	0.49	0.47
Local Bus Route 57/57A OB[a]	0.61	0.57	0.56	0.56
Harvard Shuttle Bus IB[a]	-	0.16	0.11	0.23
Harvard Shuttle Bus OB[a]	-	0.13	0.13	0.14
Kendall Shuttle Bus IB[a]	-	0.16	-	0.09
Kendall Shuttle Bus OB[a]	-	0.04	-	0.03
LMA Shuttle Bus IB[a]	-	0.39	-	0.15
LMA Shuttle Bus OB[a]	-	0.21	-	0.09
West Station-LMA-Kendall Shuttle Bus IB[a]	-	-	0.07	-
Kendall-LMA-West Station Shuttle Bus OB[a]	-	-	0.16	-

Source: CTPS, Transit Crowding Analysis (see Appendix X). a IB = inbound; OB = outbound. Volume-to-capacity (V/C) ratios greater than 1.0 indicate that the average demand during the peak hour would exceed available capacity as defined by the MBTA's Service Delivery Policy.

Transit Capacity

A comparison of vehicle loading projections between the No Build and Build Alternatives shows that any passenger overcrowding that would exceed the MBTA's Service Delivery Policy maximum load is due to growth in the No Build Alternative, and is not a result of the Project. **Therefore, no additional mitigation measures will be required to address capacity constraints.**

5.10 Air Quality/Greenhouse Gas

Project-related air quality impacts are those caused by changes in emissions generated by changes in activity levels of sources associated with the Project. These sources include motor vehicle traffic on I-90 and local roadways including intercity bus services and locomotives operating along the Worcester Main Line and the BPY layover facilities. A summary of Project-related air quality impacts are presented below for the No Build Alternative for the Project horizon year of 2040, and the I-90 Urban Interchange Preferred Alternative and three Throat Area Variations in 2040.

5.10.1 No Build

The No Build Alternative represents a future baseline condition against which the Build Alternatives are compared.

5.10.1.1 Criteria Pollutant Emissions Inventory

An emission inventory (mesoscale air quality analysis) was prepared by source, of the amount of air pollutants emitted into the atmosphere on an annual basis for the 2040 No Build Alternative. Air pollutant emissions inventories for the Study Area were prepared for VOCs, NOx, SO_2, CO, and course PM10 and $PM_{2.5}$. The sources include diesel locomotives, as well as moving and idling motor vehicles on roadways in the Study Area.

The motor vehicle miles traveled under the 2040 No Build alternative is based on 0.25% per year growth factor from 2015 through 2040. Under the 2040 No Build Alternative, it is anticipated that there will be no changes in passenger and freight locomotive operations when compared to the 2015 Existing Conditions. It is expected that the MBTA commuter train operations will facilitate eight trains and will include 20 layover movements (ten in and ten out) during the midday within the BPY layover area. Diesel emissions were calculated for both the movement and idling of locomotives in the yard.

5.10.1.2 CO Hot Spot Analysis

A microscale air quality analysis (hotspot) for CO was conducted for the 2040 No Build Alternative for the four intersections: Harvard Avenue/Franklin Street and Cambridge Street; Cambridge Street and Lincoln Street; Memorial Drive and Western Avenue; and North Harvard Street/JFK Street and Memorial Drive intersections. Graphic 5.10-1 shows the location of the four intersections. The graphic also shows a fifth intersection, (Cattle Drive and Cambridge Street), which is included in the 2040 Build Alternative hot spot analysis. Table 5.10-1 presents the results of the CO Hot Spot analysis within the Study Area. The maximum predicted one-hour and eight-hour CO concentrations, including background CO concentrations, are predicted to be 1.6 ppm and 1.0 ppm, respectively for the Harvard Avenue/Franklin Street and Cambridge Street, Cambridge Street and Lincoln Street, Memorial Drive and Western Avenue, and North Harvard Street/JFK Street and Memorial Drive intersections. For the four intersections modeled, all of the one-hour CO concentrations were well below the one-hour CO NAAQS/MAAQS of 35 parts per million (ppm), and all of the eight-hour CO concentrations were below the corresponding eight-hour CO NAAQS and MAAQS of 9 ppm. Table 5.10-2 presents the total emissions, in tons per year, from both motor vehicles and locomotives for the 2040 No Build Alternative.

Table 5.10-1: Maximum Predicted One-Hour and Eight-Hour Carbon Monoxide Concentrations (Ppm) for 2040 No Build Alternative

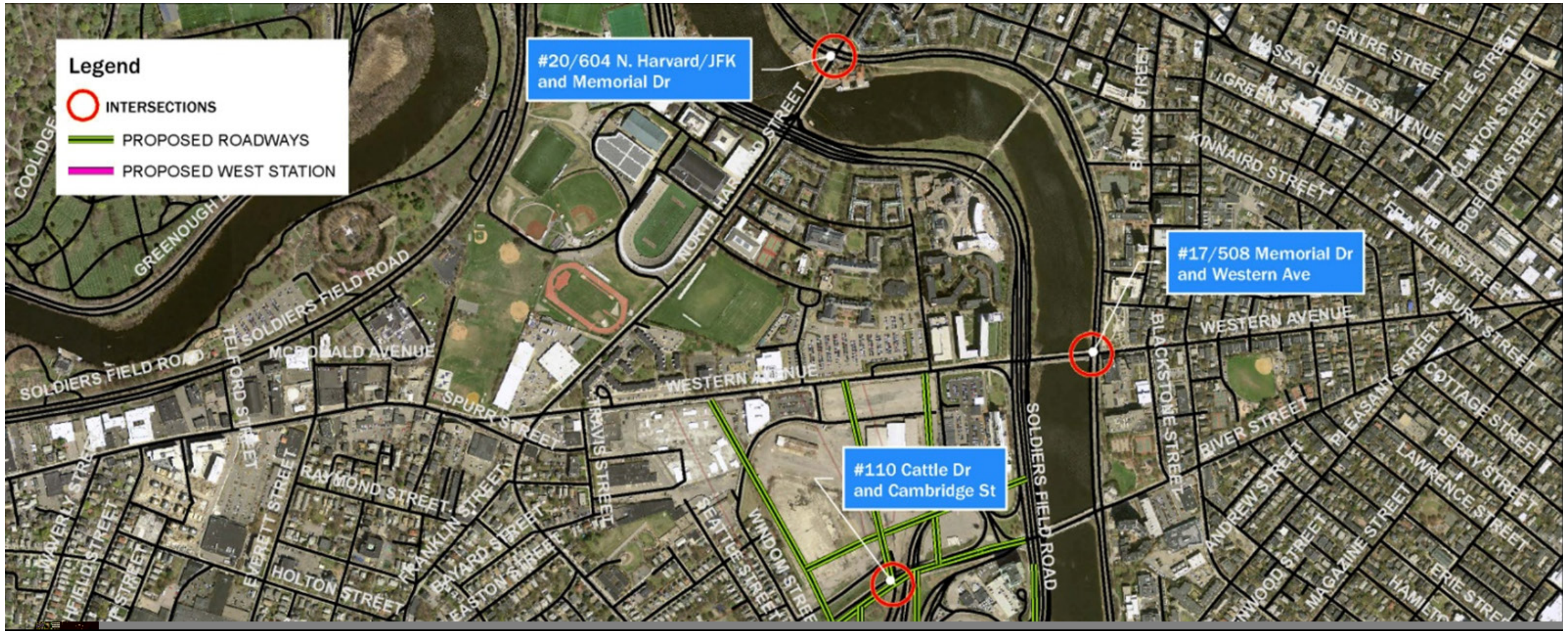
Intersection Number and Description	Maximum One-Hour		Maximum Eight-Hour	
	AM	PM	AM	PM
1/101: Harvard Ave./Franklin St. & Cambridge St.	1.6	1.6	1.0	1.0
3/103: Cambridge St. & Lincoln St.	1.6	1.6	1.0	1.0
17/508: Memorial Dr. & Western Ave.	1.6	1.6	1.0	1.0
20/604: North Harvard St./JFK St. & Memorial Dr.	1.6	1.6	1.0	1.0
NAAQS:	**35**	**35**	**9**	**9**

Notes: The added one-hour average background CO concentration is 1.4 ppm for all five cases. The added eight-hour average background CO concentration is 0.9 ppm for all five cases.

Table 5.10-2: Motor Vehicles and Locomotives Emissions Summary for 2040 No Build

Emission Source	Volatile Organic Compounds (VOCs)	Nitrogen Oxides (NO_x)	Coarse Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)	Carbon Monoxide (CO)	Sulfur Dioxide (SO_2)
Moving Vehicles	2.21	6.66	0.45	0.40	140.71	0.28
Idling Vehicles	0.78	1.03	0.15	0.14	9.48	0.09
Locomotives	0.53	4.96	0.11	0.11	5.72	0.038
Total Sources	**3.52**	**12.65**	**0.71**	**0.65**	**155.91**	**0.41**

(tons/yr)


Legend
INTERSECTIONS
PROPOSED ROADWAYS
PROPOSED WEST STATION
#20/604 N. Harvard/JFK and Memorial Dr
#17/508 Memorial Dr and Western Ave
#110 Cattle Dr and Cambridge St
SOLDIERS FIELD ROAD
WESTERN AVENUE
MCDONALD AVENUE
TELFORD STREET
RAYMOND STREET
HOLTON STREET
EVERETT STREET
FRANKLIN STREET
SPURR STREET
TRAVIS STREET
WINDOM STREET
SEATTLE STREET
EASTON STREET
BAYARD STREET
NORTH HARVARD STREET
GREENOUGH
COOLIDGE
BANKS STREET
BLACKSTONE STREET
RIVER STREET
MASSACHUSETTS AVENUE
KINNAIRD STREET
CENTRE STREET
GREEN STREET
AUBURN STREET
COTTAGE STREET
PERRY STREET
LAWRENCE STREET
PLEASANT STREET
MAGAZINE STREET
ANDREW STREET
ERIE STREET
BIGELOW STREET
CLINTON STREET
LEE STREET

Graphic 5.10-1 CO Hot Spot Intersections
Note: Intersection of Cattle Drive with Cambridge Street analyzed in the Build condition only.

5.10.1.3 $PM_{2.5}$ Hot Spot Analysis

A quantitative $PM_{2.5}$ hot spot analysis was conducted focusing only on the emissions from motor vehicles, passenger and freight trains on the existing rail lines south of the I-90 viaduct and diesel trains in the BPY layover area. Modeling was performed to calculate 24-hour and annual impacts for the 2040 No Build Alternative. The results of the analyses were compared to the 24-hour and annual $PM_{2.5}$ NAAQS/MAAQS.

The eighth highest modeled 24-hour $PM_{2.5}$ concentrations at each of the receptors analyzed for the 2040 No Build alternative are presented in Table 5.10-3. The maximum modeled $PM_{2.5}$ 24-hour concentration was predicted to be 15.8 microgram per cubic meter (µg/m^3) and included a background concentration of 15.7 µg/m^3. This maximum 24-hour $PM_{2.5}$ concentration occurred near the corner of Harry Agganis Way and Buick Street. All of the modeled 24-hour $PM_{2.5}$ concentrations at all of the receptors modeled for the 2040 No Build alternative were well below the 24-hour $PM_{2.5}$ NAAQS and MAAQS of 35 µg/m^3.

The maximum modeled annual $PM_{2.5}$ concentrations at each of the receptors analyzed for the 2040 No Build Alternative are also presented in Table 5.10-3. The maximum modeled annual $PM_{2.5}$ concentration was predicted to be 6.86 µg/m^3 and included a background concentration of 6.8 µg/m^3. This maximum annual concentration occurred near the corner of Harry Agganis Way and Buick Street. All of the modeled annual $PM_{2.5}$ concentrations at all of the receptors modeled for the 2040 No Build Alternative were well below the annual $PM_{2.5}$ NAAQS and MAAQS of 12 µg/m^3.

Table 5.10-3: Maximum Predicted 24-Hour and Annual $PM_{2.5}$ Concentrations for 2040 No Build Alternative

Averaging Period	Maximum Predicted Impact (ug/m^3)	Background Concentration (ug/m^3)	Total Impact (ug/m^3)	NAAQS (ug/m^3)
24-Hour	0.15	15.70	15.85	**35**
Annual	0.06	6.80	6.86	**12**

5.10.1.4 NO_2 Dispersion Modeling Analysis

An air dispersion analysis was performed to assess the potential NO_2 impacts focusing on the emissions from motor vehicles, passenger and freight diesel trains operating along the existing rail lines south of the I-90 viaduct and motor and diesel trains in the BPY layover area. Modeling was performed to calculate one-hour and annual impacts for the 2040 No Build Alternative. The results of the analyses were compared to the one-hour and annual NO_2 NAAQS and MAAQS.

The eighth highest modeled one-hour NO_2 concentrations at each of the receptors analyzed for the 2040 No Build are presented in Table 5.10-4. The maximum modeled one-hour NO_2 concentration is 118.80 ug/m^3 and includes a background concentration of 95.9 ug/m^3. This maximum one-hour NO_2 concentration occurred near the corner of Harry Agganis Way and Buick Street. All of the modeled one-hour NO_2 concentrations at all of the receptors modeled for the 2040 No Build were well below the one-hour NO_2 NAAQS and MAAQS of 188 ug/m^3.

The maximum modeled annual NO_2 concentrations at each of the receptors analyzed for the 2040 No Build are also presented in Table 5.10-4. The maximum modeled annual NO_2 concentration is 35.39 ug/m^3 and includes a background concentration of 33.4 ug/m^3. This maximum annual concentration occurred near the corner of Harry Agganis Way and Buick Street. All of the modeled annual NO^2 concentrations at all of the receptors modeled for the 2040 No Build were well below the annual NO_2 NAAQS and MAAQS of 100 ug/m^3.

Table 5.10-4: Maximum Predicted One-Hour and Annual No_2 Concentrations for 2040 No Build Alternative

Averaging Period	Maximum Predicted Impact (ug/m^3)	Background Concentration (ug/m^3)	Total Impact (ug/m^3)	NAAQS (ug/m^3)
One-Hour	22.90	95.90	118.80	**188**
Annual	1.99	33.40	35.39	**100**

5.10.1.5 Mobile Source Air Toxics (MSAT) Analysis

An MSAT analysis was prepared for the Project. Motor vehicles and locomotives emit MSATs in both gaseous form and particulate form. MSATs can be present in the fuels, formed from incomplete combustion of fossil fuels, or formed as secondary reaction products from the combustion emissions in the atmosphere. Following FHWA's guidelines on air toxics, a qualitative assessment of MSATs was performed. The qualitative comparison of MSATs from the various Project Alternatives was developed from the estimates of VOC and $PM_{2.5}$ emissions that were used as surrogates for indicating trends in MSAT emissions. The amount of MSATs emitted would be proportional to a combination of the Project-related VOC and $PM_{2.5}$ emissions, assuming that other variables such as motor vehicle and locomotive fleet mixes are the same for each alternative.

Annual VOC and $PM_{2.5}$ emissions were calculated for the for the 2040 No Build. Table 5.10-5 presents VOC and $PM_{2.5}$ 2040 No Build emissions in the Study Area by alternative for the Project. The changes in VOC and $PM_{2.5}$ emissions mimic the changes in MSATs. Project-related total VOC emissions for the 2040 No Build Alternative are estimated to be 3.52 tpy. When compared to the VOC emissions for the 2015 Existing Conditions of 12.78 tpy, the VOC emissions for the 2040 No Build Alternative decrease by 72%. Project-related $PM_{2.5}$. emissions for the 2040 No Build Alternative are estimated to be 0.65 tpy. When compared to the PM2.5 emissions for the 2015 Existing Conditions of 1.17 tpy, the total $PM_{2.5}$ emissions for the 2040 No Build Alternative decrease by 44%. The decrease in emissions in 2040 compared to 2015 is due to an anticipated decrease in emissions per vehicle mile traveled due to more stringent U.S. EPA vehicle emissions control standards.

Table 5.10-5: Summary of 2015 Existing Conditions and 2040 No Build Alternatives VOC and $PM_{2.5}$ Emissions

Alternative	Mesoscale Moving Emissions	Mesoscale	Total Impact (ug/m^3)	NAAQS (ug/m^3)
VOC				
2015 Existing	9.59	1.93	1.26	12.78
2040 No Build	2.21	0.78	0.53	3.52
Percent Change	-77%	-60%	-58%	-72%
$PM_{2.5}$				
2015 Existing	0.59	0.09	0.49	1.17
2040 No Build	0.40	0.14	0.11	0.65
Percent Change	-32%	+56%	-78%	-44%

(tons/yr)

Greenhouse Gas Analysis

This section addresses GHG emissions generated for the 2040 No Build Alternative. The Massachusetts EEA GHG Policy requires MassDOT to calculate and compare the GHG emissions for stationary sources (buildings) and mobile sources (transportation components) to a baseline case to determine GHG savings. Since there are no stationary sources included in the 2040 No Build, only mobile source emissions were calculated for this alternative.

The CO_2 emissions inventory at the Study Area was developed for focusing on the emissions from motor vehicles, passenger and freight diesel trains operating along the existing rail lines south of the I-90 viaduct and motor and diesel trains in the BPY layover area. The motor vehicle-generated CO_2 emissions were developed using the same roadway network used for the criteria pollutant emissions inventory discussed in Section 5.10.1.1.

Table 5.10-6 presents the total emissions, in tons per year, from both motor vehicles and locomotives for the 2040 No Build Alternative.

Table 5.10-6: 2040 No Build Motor Vehicles and Locomotives CO_2 Emissions Summary

Moving Vehicles	Idling Vehicles	Locomotives	Total Sources
40,228.46	12,583.70	4,136.65	56,948.81

(tons/yr)

I-90 Urban Interchange Preferred Alternative

The Build Alternative (I-90 Urban Interchange Preferred Alternative) including the three Throat Area Variations represents the Project-related air quality impacts, which is compared to the 2040 No Build Baseline condition. In addition, a qualitative evaluation of ultrafine particles and diesel particulate matter is also presented in this section per the request of MEPA in the Secretary's Certificate on the Project ENF.

Highway

This section focuses on the motor vehicle air quality emissions associated with the I-90 Urban Interchange Preferred Alternative and adjacent local roadways.

Criteria Pollutant and GHG Emissions Inventory

A pollutant emission inventory is a listing, by source, of the amount of air pollutants discharged into the atmosphere for a given time period (typically one year). Project-related emissions inventories for the Study Area were prepared for VOC, NO_x, CO, PM_{10}/$PM_{2.5}$, SO_2 and GHGs in the form of CO_2. The emissions inventories included emissions from motor vehicles and intercity buses on roadways in the Study Area.

Annual emissions inventories in units of tons per year (tpy) were prepared for the Study Area for the 2040 Build Alternatives. Table 5.10-7 presents a summary of the Project-related emissions inventories in the vicinity of the Project Site.

Table 5.10-7: 2040 Build Mesoscale Moving and Idling Vehicles Emissions Summary

VOC	NO_x	PM_{10}	$PM_{2.5}$	CO	SO_2	CO_2
3.50	8.49	0.71	0.63	163.81	0.42	61,198.10

(tons/yr)

CO Hot Spot Analysis

Hot spots are areas where concentrations of one or more air pollutants are expected to be elevated. A CO Hot Spot analysis was conducted for the 2040 Build Alternative. For the Study Area, the analysis evaluated the five worst-case intersections. (See Graphic 5.10-1) based on level of service analysis, total traffic volume and geographic coverage.

Table 5.10-8 presents the results of the CO Hot Spot analysis within the Study Area for the 2040 Build Alternative. The maximum predicted one-hour and eight-hour CO concentrations, including background CO concentrations, are predicted to be 1.6 ppm and 1.0 ppm, respectively for the Harvard Avenue/Franklin Street and Cambridge Street, Cambridge Street and Lincoln Street, Memorial Drive and Western Avenue, and North Harvard Street/JFK Street and Memorial Drive intersections. For the five intersections modeled, all of the one-hour CO concentrations were well below the one-hour CO NAAQS and MAAQS of 35 parts per million (ppm), and all of the eight-hour CO concentrations were below the corresponding eight-hour CO NAAQS and MAAQS of 9 ppm.

Based on the results of the CO modeling analysis at the selected traffic intersections in the Study Area, increases in Project-related motor vehicle traffic volumes would not lead to exceedances of the NAAQS and MAAQS for CO and no adverse air quality impacts are expected to occur with any of the Build Alternatives.

Table 5.10-8: Maximum Predicted One-Hour and Eight-Hour Carbon Monoxide Concentrations (Ppm) For 2040 Build Alternative

	Maximum One-Hour		Maximum Eight-Hour	
Intersection Number and Description	**AM**	**PM**	**AM**	**PM**
1/101: Harvard Ave./Franklin St. & Cambridge St.	1.6	1.6	1.0	1.0
3/103: Cambridge St. & Lincoln St.	1.6	1.6	1.0	1.0
110: Cattle Drive Connector & Cambridge St.	1.5	1.5	1.0	1.0
17/508: Memorial Dr. & Western Ave.	1.6	1.6	1.0	1.0
20/604: North Harvard St./JFK St. & Memorial Dr.	1.6	1.6	1.0	1.0
NAAQS:	**35**	**35**	**9**	**9**

Notes: Cattle Drive/Cambridge Street is new intersection in the 2040 Build Alternative.
The added one-hour average background CO concentration is 1.4 ppm for all five cases.
The added eight-hour average background CO concentration is 0.9 ppm for all five cases.

Rail Operations

The emission factors that were used to estimate the emissions from MBTA and Amtrak passenger rail locomotives and freight operations along Grand Junction and Houghton Chemical were based on the U.S. EPA *Control of Emissions from Locomotives* in 40 CFR Chapter I, Subchapter U, Part 1033. Emissions for all locomotives moving along the Worcester Mainline and in the BPY layover were based on a percentage of time braking and operating in low through high engine operations (Notch-1 through Notch-8). All locomotives at rest in the BPY layover are assumed to be idling, but limited to 30 minutes in an hour per 310 CMR 7.11.

Under the 2040 Build Alternative, it is anticipated that MBTA commuter rail service will include 56 daily trips (28 inbound and 28 outbound), and Amtrak operations will include 14 daily electric locomotive trips in each direction. Amtrak's Northeast Corridor operations will include eight daily diesel locomotive trips in each direction, and one daily trip in each direction as part of the Lake Shore Limited. Future Amtrak operations will also include four daily trips in each direction as part of the Regional New York-Boston Inland Route. In addition, it is anticipated that there will be new passenger service to Springfield/New Haven as part of a New England Intercity Rail Initiative. GJR freight movements will include three daily trips (one day and two night), and there will be no Houghton Chemical spur operations. It is expected that the MBTA commuter train operations will facilitate eight trains and will include 20 layover movements (ten in and ten out) during the midday within the BPY layover area.

Table 5.10-9 presents the diesel locomotive emissions for the 2040 Build Alternative for all rail operations on Worcester Main Line for non-MBTA services and BPY layover area.

Table 5.10-9: Rail Operations Emissions Summary

Project Alternative	VOC	NO_x	PM_{10}	$PM_{2.5}$	CO	SO_2	CO_2
2040 Rail Operations	0.44	4.10	0.09	0.09	4.73	0.019	3,738.52
2040 West Station	0.23	2.17	0.05	0.05	2.50	0.011	1,215.89
2040 Rail and West Station Operations	0.67	6.27	0.14	0.14	7.23	0.030	4,954.41

(tons/yr)

West Station

Air Quality

As discussed above, it is anticipated that MBTA commuter rail service will include 56 daily trips (28 inbound and 28 outbound). It is also anticipated that 25 of the 56 trains will stop at West Station and the remaining 31 will pass through. Trains making stops at West Station will dwell for 45 seconds to drop-off and pick-up passengers. Table 5.10-9 presents the diesel locomotive emissions for the 2040 Build Alternative for the West Station.

Greenhouse Gas

A GHG emissions analysis was performed for West Station consistent with the EOEEA *Greenhouse Gas Emissions Policy and Protocol* (May 5, 2010). The GHG Policy requires a project to quantify CO_2 emissions and to identify measures to avoid, minimize or mitigate such emissions, quantifying the effect of proposed mitigation in terms of energy savings and emissions reduction. The Project's GHG emissions will include: (1) indirect emissions of CO_2 from electricity generated off-site and used on-site for lighting and the operation of elevators; and (2) transportation emissions of CO_2.

CO_2 emissions were quantified for: (1) the Base Case, which assumes the ASHRAE 90.1-2013 code, and (2) the Mitigation Alternative, which includes all energy saving measures, detailed in Section 3.3. Boston is a Stretch Code community, and whereas the structure has no building envelope, the prescriptive Stretch Code is to follow the Massachusetts Building and Energy Code (780 CMR 13), which references the IECC 2015 code. Table 5.10-10 presents the CO_2 emissions summary. The mitigation measures for the Mitigation Alternative are described in Chapter 7.

Table 5.10-10: Greenhouse Gas (CO_2) Emissions Summary West Station

Source	Base Case	Mitigation Alternative	Change in GHG Emissions
Direct Emissions	0	0	N.A.
Indirect Emissions	123.6	78.5	-36.5%
Subtotal Direct and Indirect Emissions	**123.6**	**78.5**	**-36.5%**
Transportation Emissions	105.3	105.0	-0.3%
Total CO_2 Emissions	**228.9**	**183.5**	**-19.8%**

(tons per year) and N.A.

Throat Area Variations

This section presents the air quality analysis for the three Throat Area Variations. The pollutant emissions for the three Throat Area Variations are the same as 2040 Build Alternative (I-90 Urban Interchange Preferred Alternative) since it is assumed that there is no change in the number of vehicle-miles traveled and travel speeds between each option (See Table 5.10-7), and thus, no differences in congestion between each options is assumed.

Since the layout of each Throat Area Variation is very different in terms of how air emissions would be dispersed to the surrounding area, the focus of evaluating each Throat Area Variation was through the $PM_{2.5}$ and NO_2 air dispersion modeling analyses. A description of Throat Area Variations and modeling results are presented below.

3K-HV Variation

This variation resembles the existing highway and rail configuration within the Throat Area and replaces the existing 2,500-foot viaduct with one that is approximately 20 feet wider.

Table 5.10-11 presents the results of the $PM_{2.5}$ Hot Spot analysis for this Throat Area Variation within the Project Area. The eighth highest modeled 24-hour $PM_{2.5}$ concentrations was predicted to be 15.9 µg/m^3 and included a background concentration of 15.7 µg/m^3. These concentrations were well below the 24-hour $PM_{2.5}$ NAAQS and MAAQS of 35 ug/m3. The maximum modeled annual $PM_{2.5}$ annual concentration was predicted to be 6.9 µg/m^3 and included a background concentration of 6.8 µg/m^3, which is below the corresponding annual $PM_{2.5}$ NAAQS and MAAQS of 12 ug/m^3. Both the 24-hour and annual maximum concentrations occurred near the corner of Harry Agganis Way and Buick Street.

Table 5.10-11: Maximum Predicted 24-Hour And Annual $PM_{2.5}$ Concentrations

Alternative	Averaging Period	Maximum Predicted Impact (ug/m^3)	Background Concentration (ug/m$_3$)	Total Impact (ug/m$_3$)	NAAQS (ug/m$_3$)
2040 Build (Viaduct Option HV)	24-Hour	0.20	15.7	15.9	**35**
	Annual	0.10	6.8	6.9	**12**
2040 Build (Viaduct Option AMP)	24-Hour	0.20	15.7	15.9	**35**
	Annual	0.10	6.8	6.9	**12**
2040 Build (Viaduct Option ABC)	24-Hour	0.20	15.7	15.9	**35**
	Annual	0.10	6.8	6.9	**12**

Table 5.10-12 presents the results of the NO_2 air dispersion modeling analysis for this Throat Area Variation within the Project Area. The eighth highest modeled one-hour NO_2 concentrations was predicted to be 122.4 µg/m^3 includes a background concentration of 95.9 µg/m^3, and is below the one-hour NO_2 NAAQS and MAAQS of 188 ug/m^3. The maximum modeled annual NO_2 concentration was predicted to be 35.5 µg/m^3 includes a background concentration of 33.4 µg/m^3, and is well below the corresponding annual NO_2 NAAQS and MAAQS of 100 ug/m^3. Both the one-hour and annual maximum concentrations occurred near the corner of Harry Agganis Way and Buick Street.

Table 5.10-12: Maximum Predicted One-Hour and Annual NO_2 Concentrations

Alternative	Averaging Period	Maximum Predicted Impact (ug/m^3)	Background Concentration (ug/m$_3$)	Total Impact (ug/m$_3$)	NAAQS (ug/m$_3$)
2040 Build (Viaduct Option HV)	One-Hour	26.4	95.9	122.4	**188**
	Annual	2.08	33.4	49.1	**100**
2040 Build (Viaduct Option AMP)	One-Hour	29.4	95.9	125.4	**188**
	Annual	2.27	33.4	35.7	**100**
2040 Build (Viaduct Option ABC)	One-Hour	29.0	95.9	124.9	**188**
	Annual	2.18	33.4	35.6	**100**

3K-AMP Variation

This variation replaces the existing 2,500-foot viaduct with a partially at grade/below grade I-90. The GJR rail will be placed on a 2,100-foot viaduct over I-90 eastbound and the Worcester Main Line tracks will be partially at grade/below grade. As discussed above, the motor vehicles and moving locomotives were modeled as volume sources and idling locomotives in the BPY layover area and West Station were modeled as point sources.

Table 5.10-11 presents the results of the $PM_{2.5}$ Hot Spot analysis for this variation within the Project Area. The eighth highest modeled 24-hour $PM_{2.5}$ concentrations was predicted to be 15.9 µg/m^3 and included a background concentration of 15.7 µg/m^3 were well below the 24-hour $PM_{2.5}$ NAAQS and MAAQS of 35 micrograms per cubic meter (ug/m^3). The maximum modeled annual $PM_{2.5}$ annual concentration was predicted to be 6.9 µg/m^3, includes a background concentration of 6.8 µg/m^3 and is below the corresponding annual the corresponding annual $PM_{2.5}$ NAAQS and MAAQS of 12 ug/m^3. Both the 24-hour and annual maximum concentrations occurred near the corner of Harry Agganis Way and Buick Street.

Table 5.10-12 presents the results of the NO_2 air dispersion modeling analysis for this variation within the Project Area. The eighth highest modeled one-hour NO_2 concentrations was predicted to be 125.4 µg/m^3, includes a background concentration of 95.9 µg/m^3 and is below the one-hour NO_2 NAAQS and MAAQS of 188 micrograms per cubic meter (ug/m^3). The maximum modeled annual NO_2 annual concentration was predicted to be 35.7 µg/m^3, includes a background concentration of 33.4 µg/m³ and is below the corresponding annual NO_2 NAAQS and MAAQS of 100 ug/m³. Both the one-hour and annual maximum concentrations occurred near the corner of Harry Agganis Way and Buick Street.

3K-ABC Variation

The 3K-ABC Variation will replace the existing 2,500-foot viaduct with a partially at grade/below grade I-90. A majority of the four GJR and Worcester Main Line rail tracks will be placed at grade parallel to I-90 along the southern portion of the Throat Area.

As discussed above, the motor vehicles and moving locomotives were modeled as volume sources and idling locomotives in the BPY layover area and West Station were modeled as point sources. Table 5.10-11 presents the results of the $PM_{2.5}$ Hot Spot analysis for this variation within the Project Area. The eighth highest modeled 24-hour $PM_{2.5}$ concentrations was predicted to be 15.9 µg/m³, includes a background concentration of 15.7 µg/m³ and were well below the 24-hour $PM_{2.5}$ NAAQS and MAAQS of 35 micrograms per cubic meter (ug/m³). The maximum modeled annual $PM_{2.5}$ annual concentration was predicted to be 6.9 µg/m³, includes a background concentration of 6.8 µg/m³ and is below the corresponding annual the corresponding annual $PM_{2.5}$ NAAQS and MAAQS of 12 ug/m³. Both the 24-hour and annual maximum concentrations occurred near Nickerson Field.

Table 5.10-12 presents the results of the NO_2 air dispersion modeling analysis for this variation within the Project Area. The eighth highest modeled one-hour NO_2 concentrations was predicted to be 124.9 µg/m³ and included a background concentration of 95.9 µg/m³ and is below the one-hour NO_2 NAAQS and MAAQS of 188 ug/m³. The maximum modeled annual NO_2 annual concentration was predicted to be 35.6 µg/m³, includes a background concentration of 33.4 µg/m³ and is below the corresponding annual NO2 NAAQS and MAAQS of 100 ug/m³. Both the one-hour and annual maximum concentrations occurred near Nickerson Field.

Summary of Preferred Alternative and Throat Variation Impacts

Air and GHG Emissions Inventory

This section presents a comparison of the 2040 No Build and 2040 Build Alternatives to determine the potential increases in emissions. Table 5.10-13 presents the total emissions, in tons per year, for VOC, NO_x, CO, PM10, $PM_{2.5}$, SO_2 and CO_2 from both motor vehicles and locomotives for the 2040 No Build and Build Alternatives. The 2040 No Build Alternative also includes rail operations on Worcester Main Line and BPY layover area. The 2040 Build Alternative, including the three Throat Area Variations, also includes rail operations on Worcester Main Line and BPY layover area and the addition of West Station. The pollutant emissions for the three Throat Area Variations are the same as 2040 Build Alternative (I-90 Urban Interchange Preferred Alternative) since it is assumed that there is no change in the number of vehicle-miles traveled and travel speeds between each option. No differences in congestion between each options is a simplified assumption used in this analysis. However, it is likely that emissions from the 3K-AMP and 3K-ABC Variations will be higher than the 3K-HV Variation due to the narrow lanes for both of these alternatives compared to 3K-HV.

Table 5.10-13: Motor Vehicles and Locomotives Emissions Summary

Project Alternative	VOC	NO_x	PM_{10}	$PM_{2.5}$	CO	SO_2	CO_2
2040 No-Build	3.52	12.65	0.71	0.65	155.91	0.41	56,948.81
2040 Build*	4.18	14.84	0.86	0.77	171.14	0.47	66,152.81

*(tons/yr). *Emissions include both rail operations and West Station.*

Table 5.10-14 presents a summary of the Project-related emissions inventories in the vicinity of the Project Site, described in detail throughout the section above. Project-related pollutant emissions for 2040 Build are higher by an average of about 17% when compared to the emissions for the 2040 No Build Alternative. Project-related emissions for the Throat Area Variations are also higher by an average of about 17% when compared to the 2040 No Build Alternative emissions. This increase in emissions, and is because the additional capacity increases the efficiency of roadways in the Project Area and attracts rerouted trips from elsewhere in the transportation network. The increase in additional rail service along the Worcester Main Line and operations of the BPY layover area also increases of locomotive emissions. Proposed mitigation measures, discussed in Section 8.10, will reduce the growth Project-related emissions between the 2040 No Build and 2040 Build Alternatives.

The 2040 Build emissions will likely be lower than present levels in the Design Year as a result of U.S. EPA's national control programs that are projected to significantly reduce annual emissions by over 10% to 56% between 2018 and 2030 and beyond.[20] Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates and local control measures. However, the magnitude of the U.S. EPA-projected reductions is so great (even accounting for VMT growth) that emissions in the Study Area are likely to be lower in the future in nearly all cases. Proposed mitigation measures, discussed in Chapter 7, will reduce the growth Project-related emissions between the 2040 No Build and 2040 Build Alternatives.

Table 5.10-14: Comparisons of Total Air Quality Emissions Calculations

Comparison	VOC	NO_x	PM_{10}	$PM_{2.5}$	CO	SO_2	CO_2
2040 Build compared to 2040 No-Build	+18.9%	+17.3%	+20.7%	+18.8%	+9.8%	+13.6%	+16.2%

CO Hot Spot Analysis

Based on the results of the CO modeling analysis at the selected traffic intersections in the Study Area, increases in Project-related motor vehicle traffic volumes would not lead to exceedances of the NAAQS and MAAQS for CO, and no adverse air quality impacts are expected to occur with any of the Build Alternatives.

Mobile Source Air Toxics Analysis

This section compares the 2040 Build VOC and $PM_{2.5}$ emissions to the 2040 No Build Alternative. Tables 5.10-15 and 5.10-16 presents VOC and $PM_{2.5}$5 Project-related emissions in the Study Area. The changes in VOC and PM2.5 emissions mimic the changes in MSATs. Project-related VOC emissions for the three Throat Area Variations in 2040 without mitigation are estimated to be 4.17 tpy. When compared to the VOC emissions for the 2040 No Build Conditions of 3.52 tpy, the VOC emissions for the 2040 Build Throat Area Variation without mitigation increase by 18%.

Project-related $PM_{2.5}$ emissions for the three Throat Area Variations in 2040 are estimated to be 0.77 tpy. When compared to the $PM_{2.5}$ emissions for the 2040 No Build Conditions of 0.65 tpy, the PM2.5 emissions for the 2040 Build Alternative increase by 18%.

The combined differences in VOC and $PM_{2.5}$ emissions from the 2040 No Build Alternative to the 2040 Build Alternative result in a total increase of MSAT surrogates of 18%. This increase in VOC and $PM_{2.5}$ emissions, and thus, mobile source-related MSAT surrogates, is because the additional capacity increases the efficiency of roadways in the Project Area and attracts rerouted trips from elsewhere in the transportation network. The increase in additional rail service along the Worcester Main Line and operations of the BPY layover area also increases of locomotive emissions.

Table 5.10-15: 2040 Build Alternative (All Three Viaduct Throat Options) VOC Emissions Summary

Alternative	Mesoscale Moving Emissions	Mesoscale Idling Emissions	Locomotive Emissions	Total VOC Emissions
2040 No-Build	2.21	0.78	0.53	**3.52**
2040 Build	2.37	1.13	0.68	**4.18**
Percent Change	+7%	+45%	+26%	**+18%**

(tons/yr).

Table 5.10-16: 2040 Build Alternative (All Three Viaduct Throat Options) $PM_{2.5}$ Emissions Summary

Alternative	Mesoscale Moving Emissions	Mesoscale Idling Emissions	Locomotive Emissions	Total VOC Emissions
2040 No-Build	0.40	0.14	0.11	**0.65**
2040 Build	0.43	0.20	0.14	**0.77**
Percent Change	+8%	+43%	+27%	**+18%**

(tons/yr).

Regardless of the Throat Are Variation chosen, emissions will likely be lower than present levels in the Design Year as a result of U.S. EPA's national control programs that are projected to reduce annual MSAT emissions by over 90% between 2010 and 2050 (Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents, Federal Highway Administration, October 12, 2016). Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates and local control measures. However, the magnitude of the U.S. EPA-projected reductions is so great (even account for VMT growth) that MSAT emissions in the Study Area are likely to be lower in the future in nearly all cases.

Additional Requested Analyses

In the Secretary's Certificate on the Project ENF, MEPA requested additional studies in addition to the emissions inventories, CO Hot Spot analyses and the MSAT analyses. These assessments include ultrafine particulates and diesel particulate matter. A summary of these assessments is provided below and a complete discussion of these assessments is contained in the Air Quality Analysis Appendix F.

Summary of the Discussion of Ultrafine Particles

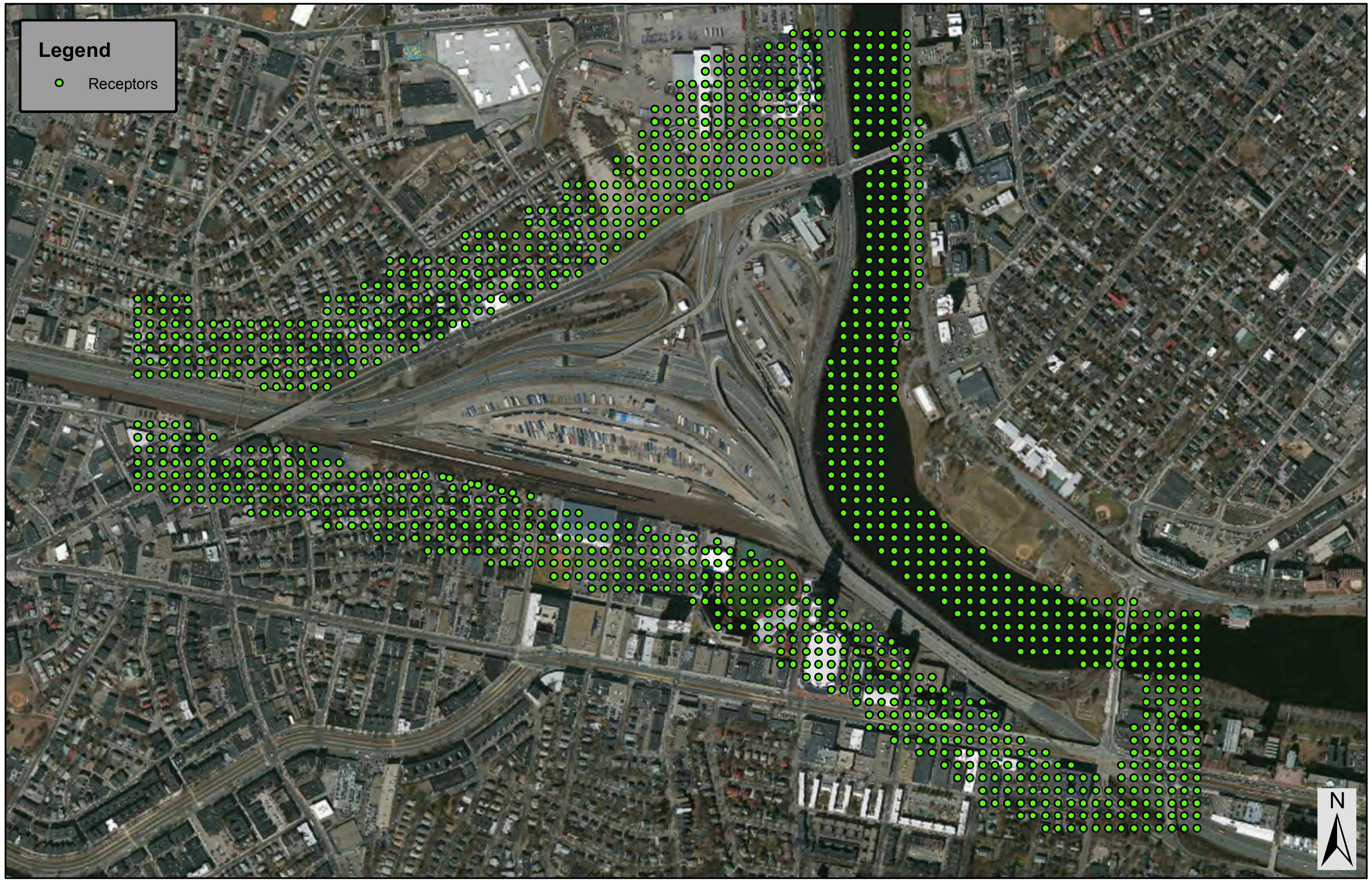
An expanded discussion of ultrafine particles is presented in the Air Quality Analysis Appendix F Ultrafine particulates (UFPs) refer to particulate matter that is generally less than 100 nanometers in size. Compared with $PM_{2.5}$, the ultrafine particles would be 0.1 microns and smaller or roughly 25 times smaller than the regulated $PM_{2.5}$. UFPs can come from natural sources, or be artificially created by humans. Man-made sources include combustion of all petroleum products, which include all non-electrical transportation sources, home heating and power generation.

Compared with bigger particles of the same mass concentration, UFPs have much higher numbers and surface areas to carry other toxic agents and penetrate deeper into the lungs. Once inside the lungs, the UFPs could penetrate the tissues and be absorbed into the blood stream. Therefore, ultrafines have the capacity to cause respiratory and cardiovascular effects.

Currently, there is insufficient data available to accurately perform a quantitative assessment of UFP emissions from the various Project Alternatives. However, a general qualitative assessment can be made by assuming that the emissions of diesel particulate in the vicinity of Project Area will follow the emissions trends of $PM_{2.5}$ emissions from diesel fueled sources. The diesel fueled sources include locomotives and motor vehicles including buses. Using $PM_{2.5}$ emissions from diesel fueled sources as a surrogate, UFP emissions are expected to increase with the growth in diesel powered vehicles. For the 2040 future alternatives, the 2040 Build Alternative including the three Throat Area Variations would produce more UFP emissions than the No Build Alternative. However, it is likely that the 3K-AMP and 3K-ABC UFP emissions will be higher than the 3K-HV Variation due to the narrow lanes causing more congestion and increase in idling emission for both of these alternatives compared to 3K-HV. Furthermore, the implementation of transportation mitigation measures will reduce the UFP levels below those projected for the 2040 Build Alternative without mitigation.

Summary of Diesel Particulate Matter Discussion

An expanded discussion of diesel particulate matter is presented in the Air Quality Analysis Appendix F. Diesel particulate matter (DPM) is part of a complex mixture that makes up diesel exhaust which is emitted from a broad range of diesel engines including on road diesel engines of trucks, buses and cars, and the off-road diesel engines that include railroad locomotives. Short-term exposure to high concentrations of DPM can cause headache, dizziness, and irritation of the eye, nose and throat. Prolonged DPM exposure can increase the risk of cardiovascular, cardiopulmonary and respiratory disease and lung cancer.



Graphic 5.10-2: Receptor Network

At the present time, sufficient data are not available to accurately achieve a quantitative assessment of DPM emissions from various Project Alternatives. Information on DPM emissions for all sources (i.e., locomotives, and motor vehicles) are not available; however, a general qualitative assessment assumes that emissions of DPM would follow the emissions trends of $PM_{2.5}$, as diesel fueled sources include locomotives and intercity buses. Using $PM_{2.5}$ emissions from diesel fueled sources as a surrogate, DPM emissions are expected to increase with the growth in diesel powered vehicles. For the 2040 future alternatives, the 2040 Build Alternative including the three Throat Area Variations would produce more DPM emissions than the 2040 No Build Alternative. However, it is likely that the 3K-AMP and 3K-ABC DPM emissions will be higher than the 3K-HV Variation due to the narrow lanes for both of these alternatives compared to 3K-HV. Furthermore, the implementation of transportation mitigation measures will reduce the DPM levels below those projected for the 2040 Build Alternative without mitigation.

Receptor Network

A grid was used to locate receptors every 82 feet (25 meters) from the edge of the roadways and rail lines out to approximately 500 feet. The grid represents sensitive location, such as residences, office buildings, schools, parks, playgrounds, businesses, and other areas where the public has access, creating 1,335 receptors. Graphic 5.10-2 shows the receptor grid.

5.11 Noise and Vibration

This section presents the findings of the noise and vibration assessment performed for the Project Area and includes a summary of the methods used to predict noise and vibration conditions, applicable noise and vibration impact criteria, results of the impact assessment, and an evaluation of potential noise and vibration mitigation. An evaluation of the feasibility and reasonableness of noise barriers in specific locations has also been included. The likelihood of potential noise barriers being implemented will be affected by the viewpoints of potentially benefitted receptors. Outreach to potentially benefitted receptors will include a public information meeting and a mail survey to determine if the proposed barriers are acceptable to receptors. Section 4.11 provides a detailed description of existing noise conditions.

An analysis of potential noise barriers beyond the western limits of the Project has been included since the Project may facilitate the construction of such barriers, even though the existing noise conditions in the area will remain unchanged by the Project.

5.11.1 Noise and Vibration Impact Assessment Methodology

The methodology used to assess potential noise and vibration impacts includes identifying noise and vibration-sensitive receptors, characterizing the existing noise and vibration conditions in the Study Area, predicting noise and vibration for the future No Build (2040) and Design Year Build (2040) conditions, assessing potential impact according to MassDOT Noise Abatement Criteria and Federal Transit Administration (FTA) criteria, and evaluating the feasibility and reasonableness of mitigation. Noise and vibration were analyzed for all three Throat Area Variations including:

- 3K-HV (Highway Viaduct/Rail at Grade)
- 3K-AMP (Rail Viaduct/Highway at Grade)
- 3K-ABC (Highway and Rail at Grade)

The Project variations affect noise and vibration impact and the mitigation evaluation primarily in the BU (West Campus), PDW Path and Cambridgeport areas.

Noise and vibration conditions were evaluated for the Opening Year (2025), which is when the roadway improvements will have been completed and the rail yard will accommodate up to 16 train sets for mid-day layover, but West Station will not be completed. This will be a similar condition to the Design Year (2040) condition except that all of the MBTA 2025 revenue operations will be through movements without a station, and the rail yard will facilitate a fewer number of trains for mid-day layover (eight train sets are planned for the 2040 Design Year Build). Therefore, the evaluation compares train noise emissions between the Opening Year and the Design Year to determine if there will be any substantial difference in noise and vibration that may result in additional impact or warrant additional mitigation not identified in the Design Year analyses.

Noise and vibration-sensitive receptors were identified throughout the Study Area using the Massachusetts Geographical Information Systems (MassGIS) database, BPDA Zoning database, City of Cambridge CityViewer GIS database and field observations.

As described in the Noise and Vibration section of Chapter 4, existing noise and vibration measurements were characterized throughout the Study Area through noise and vibration measurements and modeling. Noise and vibration conditions for the future Design Year Build and No Build conditions were determined by modeling.

Highway and road noise was modeled using the FHWA's Traffic Noise Model (TNM), Version 2.5. The input data to TNM includes traffic volumes, speeds and distribution of vehicle classifications, and roadway design geometry. Existing and future traffic data are presented in the Traffic and Safety sections in Chapter 4 and Chapter 5, respectively, and also in Appendix C.

Train noise and vibration were modeled using the FTA's Detailed Noise and Vibration Assessment methodologies, as described in the FTA's guidance manual, *Noise and Vibration Impact Assessment* (dated May 2006). The input data to these models included the existing and planned number and type of train operations, including MBTA commuter train revenue service, MBTA commuter train mid-day yard movements and idling, freight movements on the GJR line, Amtrak trains, train speeds, number of station stops, track type (i.e., tangent track, curved track or crossover), and the track design geometry, including whether the alignment would be on structure or at-grade. Existing and future train operations data are presented in the Rail/Transit section in Chapter 4 and Chapter 5, respectively.

Further information on the methods used to predict noise and vibration from highway and rail sources is provided in the Noise and Vibration Technical Report in Appendix H.

5.11.2 Noise Impact Criteria

As described in Section 4.11.3.2, noise and vibration-sensitive land uses in the Study Area have been identified in accordance with FHWA Land Use Categories (A through F) and FTA Categories (1 to 3).

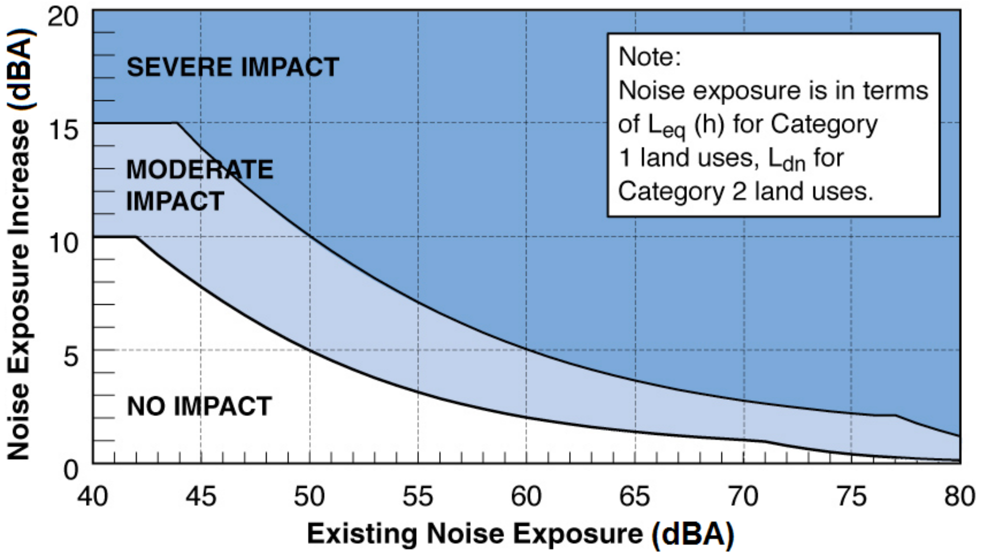
The FTA noise categories include the following:

- **FTA Noise Category 1:** Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land uses as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use. Also included are recording studios and concert halls.
- **FTA Noise Category 2:** Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a nighttime sensitivity is assumed to be of utmost importance.
- **FTA Noise Category 3:** Institutional land uses with primarily daytime and evening use. This category includes schools, libraries, theaters and churches where it is important to avoid interference with such activities as speech, meditation and concentration on reading material. Places for meditation or study associated with cemeteries, monuments, museums, campgrounds and certain historical sites and parks with passive use are included in this category.

There are some buildings, such as television studios, concert halls, recording studios and theaters, that can be very sensitive to noise and/or vibration and may warrant special attention.

FTA noise impact criteria are founded on well-documented research on community reaction to noise. They are based on change in noise exposure using a sliding scale. Lower levels of transit noise are allowed in areas where existing noise levels are relatively low since the introduction of a new noise source can be more perceptible under these conditions. In neighborhoods where existing noise levels are higher, higher levels of transit noise are allowed since the existing noise will tend to mask the new source.

For projects such as the I-90 Allston Interchange Project, where there are existing sources of noise, impact is assessed by comparing the existing noise exposure to the potential increase in noise due to the proposed track infrastructure improvements, as shown in Graphic 5.11-1.



Graphic 5.11-1: FTA Noise Impact Criteria. Source: FTA, 2006

MassDOT categorizes noise-sensitive land use consistent with FHWA regulations, which depend on the type of land use. Table 5.11-1 shows the FHWA Land Use Activity Categories, the description of the type of land use within the category, and the Noise Abatement Criteria (NAC) based on loudest-hour noise levels (Leq). Noise abatement must be considered if levels approach or exceed the NAC, which MassDOT has established as being within 1 decibel. For example, if the loudest-hour noise level at a residential receptor is 66 decibels (dBA), then this is approaching the NAC, and mitigation needs to be considered. The Noise Section in Chapter 4 provides further information on the MassDOT and FTA land use categories.

Receptors are primarily located at ground-level outdoor areas of frequent human use. For some institutional facilities, such as hospitals, schools, libraries, places of worship and recording studios, receptors may be located inside the building if there are no areas of frequent outdoor human use. If an upper-floor, multi-family residence has exterior areas, such as balconies or roof decks, then receptors will be located at these upper elevations. In accordance with FHWA regulations, noise and vibration are assessed at existing sensitive uses and tracts of land that have already been permitted for sensitive use. If tracts of land are not permitted for sensitive use, they are not eligible for potential noise mitigation, but future noise conditions may be evaluated for informational and development planning purposes.

Table 5.11-1: MassDOT Noise Abatement Criteria (NAC)

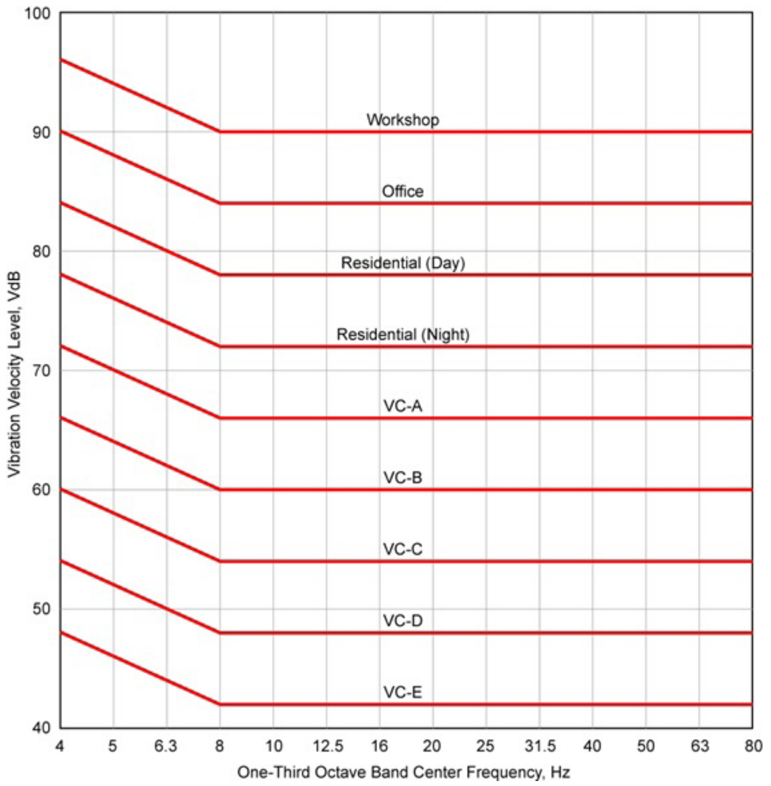
Activity Category	Loudest-Hour Noise Level (Leq)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purposes
B*	67 (Exterior)	Residential
C*	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools and television studios
E*	72 (Interior)	Hotels, motels, offices, restaurants/bars and other developed lands, properties or activities not included in Categories A-D or F
F	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical) and warehousing
G	--	Undeveloped lands that are not permitted

**Includes undeveloped lands permitted for this Activity Category. Source: MassDOT, 2011*

5.11.3 Vibration and Ground-borne Noise Impact Criteria

Vibration-sensitive land uses are similar to noise-sensitive land uses except that vibration, as it relates to human annoyance, is only evaluated inside buildings.

Table 5.11-2 presents the FTA general ground-borne vibration and Table 5.11-3 presents the general ground-borne noise impact criteria. The general vibration criteria, which are based on the overall level, are used when the frequency content of vibration is not available.



Graphic 5.11-2: FTA Detailed Vibration Impact Criteria. Source: FTA, 2006

Graphic 5.11-2 presents the FTA detailed vibration impact criteria applied when the vibration frequency spectrum is available. The "vibration curve" (VC) criteria apply to various types of vibration-sensitive equipment that are commonly found in research or medical facilities such as microscopes or imaging equipment. The Residential (Night) criteria apply to Category 2 land uses. For Institutional (Category 3) buildings, the detailed 1/3-octave band criteria are applied at the corresponding overall FTA general criterion. For example, at school buildings where there are an occasional number of train events, the vibration criterion of 78 VdB is applied to frequencies between 8 and 80 hertz (Hz).

The vibration criteria also depend on existing conditions. For projects in existing rail corridors with more than 12 trains per day, a project will cause impact only if vibration levels were to exceed the FTA criteria and the project were to significantly increase the number of vibration events (approximately doubling the number of events), or if the project will increase vibration levels by 3 VdB or more. If a project moves existing tracks, there will be impact only if the track relocation results in vibration levels exceeding the FTA criteria and increasing more than 3 VdB.

Further information on the FTA vibration criteria is provided in the Noise and Vibration Technical Report in Appendix H.

Table 5.11-2 FTA General Ground-borne Vibration Impact Criteria

FTA Vibration Category	Ground-borne Vibration Impact Criteria (VdB)		
	Frequent Events*	Occasional Events**	Infrequent Events***
Category 1: Buildings where low ambient vibration is essential for interior operations	65	65	65
Category 2: Residences and buildings where people normally sleep	72	75	80
Category 3: Institutional land uses with primarily daytime use.	75	78	83
Concert hall	65	65	65
TV studio	65	65	65
Recording studio	65	65	65
Auditorium	72	80	80
Theatre	72	80	80

**Frequent Events is greater than 70 trains per day*
***Occasional Events is between 30 and 70 trains per day*
****Infrequent events is fewer than 30 trains per day*
Source: FTA, 2006

Table 5.11-3 FTA General Ground-borne Noise Impact Criteria

FTA Vibration Category	Ground-borne Noise Impact Criteria (dBA)		
	Frequent Events*	Occasional Events**	Infrequent Events***
Category 1: Buildings where low ambient vibration is essential for interior operations	n/a	n/a	n/a
Category 2: Residences and buildings where people normally sleep	35	38	43
Category 3: Institutional land uses with primarily daytime use	40	43	48
Concert hall	25	25	25
TV studio	25	25	25
Recording studio	25	25	25
Auditorium	30	38	38
Theatre	35	43	43

**Frequent Events is greater than 70 trains per day*
***Occasional Events is between 30 and 70 trains per day*
****Infrequent events is fewer than 30 trains per day*
n/a: not applicable
Source: FTA, 2006

5.11.4 Noise Abatement Evaluation Methodology

If the assessment indicates there would be noise impact and/or if noise levels would exceed the NAC, then noise abatement needs to be considered. Potential noise abatement measures include traffic management measures, traffic control devices, vehicle-type restrictions, nighttime-use restrictions, speed reduction, designated lanes, alteration of the horizontal or vertical alignment, or construction of noise barriers.

The feasibility and reasonableness of noise walls is evaluated according to MassDOT Type I and Type II Noise Abatement Policies and Procedures (effective July 13, 2011). If the assessment indicates there will be vibration impact, then the need for and effectiveness of vibration mitigation is evaluated according to the FTA's guidance manual.

MassDOT has criteria to evaluate whether noise walls are likely to be constructed as part of Type I or Type II projects. These criteria have been established to provide a consistent approach and procedures for providing noise abatement across the entire state. The criteria evaluate the need for mitigation and whether it would be feasible and reasonable. If a noise wall is determined to be feasible and reasonable, then the viewpoints of property owners and residences are surveyed to determine if at least two-thirds of the weighted total number of residential votes are in favor of the barrier.

MassDOT will hold a public information meeting in the neighborhoods where a barrier is proposed and a mail survey will be conducted. MassDOT's feasibility and reasonableness criteria address the following factors:

- **Engineering feasibility:** The barrier must be able to be constructed given the topography, roadway geometry, and potential conflicts with utilities, access requirements and maintenance needs. The barrier must maintain safety requirements regarding clear zones, redirection of crash vehicles, snow removal, sight distances and fire access. Typically, a minimum of 10 feet is provided between the roadway and the noise barrier for snow storage.
- **Acoustic feasibility:** The barrier should provide at least 5 dBA of noise reduction at the majority of first-row receptors. The barrier should also achieve the Noise Reduction Design Goal, which is to provide a minimum of 10 dBA of noise reduction to at least one first-row receptor.
- **Cost effectiveness:** Because MassDOT must balance available funds statewide, the Cost Effectiveness Index (CEI) is calculated for all noise barriers to consider the reasonableness of mitigation. In residential areas, the CEI is calculated based on the cost of the barrier (at $50 per square foot), the average noise reduction of benefited receptors (those receiving 5 dB or more of noise reduction), and the number of benefited receptors (housing units). The CEI criteria for residential areas is $8,400 per decibel of noise reduction per housing unit. For Activity Category C and D land uses such as schools, parks and trails, the CEI is based on the barrier cost, average noise reduction, and the number of people who use the facilities and the amount of time they use it. The CEI criteria for these land uses is $138 per decibel of noise reduction per person per hour of use.

5.11.5 Noise Impact Assessment Results

This section presents the results of the noise impact assessment. Design Year (2040) noise levels were computed, including the loudest-hour Leq and day-night average Ldn levels. The noise assessment shows that the Design Year noise levels represent the worst-case noise and vibration condition compared to interim conditions, such as the Opening Year (2025) condition where construction of I-90, SFR and other Project roadways would be completed, the rail yard would facilitate layover, and West Station will not yet be constructed. The Design Year represents the highest noise condition because the traffic volumes will be highest in 2040 compared to earlier years, and train operations on the Worcester Main Line and GJR, not including train movements to the yard, will also be highest in 2040. While there will likely be a greater number of trains laying over in the yard in the interim years, the contribution of noise from these train movements is substantially lower than other sources.

There is potential for air rights developments over I-90 that could substantially reduce noise emissions in the Design Year. Since the specific locations where air rights may occur is unknown at this time, the noise assessment does not include the associated noise reduction.

Noise levels were calculated for all Project sources, and separately for roadway and train sources, to understand the relative contribution from different sources with this multi-modal Project. This information is of particular interest as it relates to the feasibility and acoustical effectiveness of potential noise abatement. In areas with significant contribution from multiple sources, it may be necessary to mitigate noise from multiple sources.

Noise was evaluated at receptors grouped in the following areas:

- Allston Village and the Pratt Street/Wadsworth Street Area
- BU (West Campus) Area
- PDW Path, Magazine Beach, Cambridgeport and Riverside
- Cambridge Street
- Lincoln Street (Type II Barrier Area)
- Innovation Area (for information purposes only, not eligible for abatement)

Loudest-hour noise levels, including all Project sources, were assessed according to the NAC. Since the NAC are absolute noise level limits, there can be a need to evaluate noise abatement for receptors that are already in a high existing noise environment and where the Project does not increase, (or even decreases), future noise conditions.

Noise impact was also assessed according to the FTA impact criteria that compare existing Ldn (for residential receptors) or Leq (for institutional receptors) to Design Year noise levels. FTA noise impact would occur if there is a significant increase in future noise levels. Since this Study Area is in a relatively high existing noise environment, potential impact is more likely to be identified based on the NAC rather than the FTA impact criteria.

This noise assessment includes an evaluation of potential Type II noise barriers on the westbound side of I-90 between Cambridge Street and Everett Street and between Everett Street and Market Street. As described in section 4.11.1.1, the project may facilitate the potential construction of these Type II noise barriers. The evaluation of Type II noise barriers is based on existing noise levels, and the Project including all of the Throat Area Variations, would not change noise conditions in this area. Consequently, for this area, design year noise levels are not reported and Project impacts are not assessed according to FTA criteria.

5.11.5.1 Allston Village and Pratt Street/Wadsworth Street Area

All three Throat Area Variations will have a similar effect on future noise conditions in this area. The Project will realign I-90 closer to receptors in Allston Village and the Pratt Street/Wadsworth Street area. The Worcester Main Line tracks will not be substantially different than their existing alignment. There will be an increase in the number of train operations, and most MBTA trains will stop at the proposed West Station in the 2040 Design Year Build condition. MBTA trains will layover in the rail yard during the mid-day. The movement of trains into the yard and idling of locomotives (up to 30 minutes) prior to plugging in will introduce noise sources similar in nature to CSX train yard operations in prior years.

As shown in Table 5.11-4, the loudest-hour Design Year noise levels will be 78 to 80 dBA (Leq) and 79 to 82 dBA (Ldn) at first-row receptors such as CS-1, CS-2, AV-1 and AV-2. At second-row and setback receptors, such as AV-5, AV-6, AV-3 and CS-5, the Design Year noise levels will be 67 to 73 dBA (Leq) and 69 to 74 dBA (Ldn). Graphic 5.11-3 presents the noise conditions prior to noise abatement.

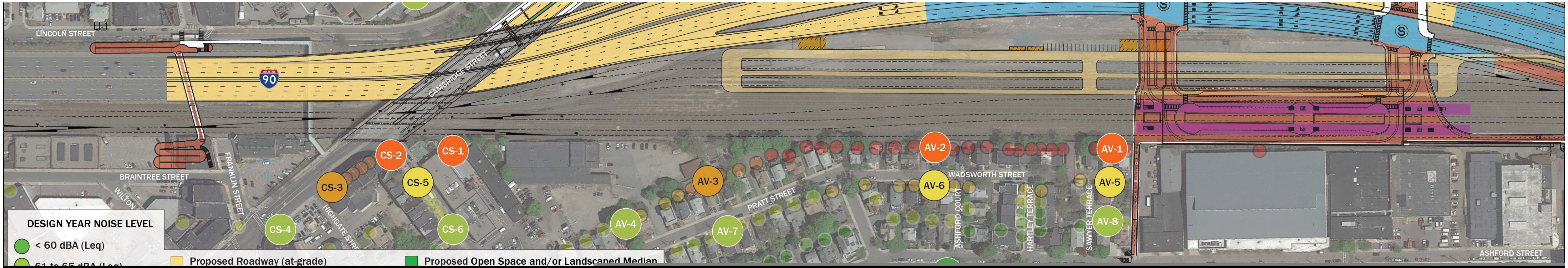
Train operations are the predominant noise source in this area, especially for receptors near the Main Line tracks. For example, train noise is generally 15 dB higher than highway noise at first-row receptors on Wadsworth Street. Receptors near Cambridge Street and Linden Street typically have similar contributions of noise from roadway and train sources.

The impact assessment shows that Design Year Leq noise levels will exceed the NAC at all first-row and many second-row receptors. Design Year Ldn noise levels with the Project will generally be within 1 to 2 dB of existing conditions. There will be FTA moderate noise impact at first-row receptors on Wadsworth Street and Linden Street. Since Design Year Leq noise levels will exceed the NAC, it is necessary to consider noise abatement, such as a noise wall, to mitigate potential impact in this analysis area.

Table 5.11-4: 2040 Noise Impact Assessment Results Prior to Abatement - Allston Village & Pratt Street/Wadsworth Street Area – All Variations

Receptor Number	Location	Design Year Build Loudest-Hour Noise Level (Leq, dBA)			MassDOT NAC Assessment	Day-Night Average Noise Level (Ldn, dBA)				FTA Noise Impact Assessment
		Road Sources	Train Sources	Total		Existing (2017)	FTA Impact Criteria: Moderate	FTA Impact Criteria: Severe	Design Year Build	
CS-1	Our Future Learning Center	70.6	78.2	78.9	Exceeds NAC	77.1*	77.9*	81.8*	78.9*	Moderate
CS-2	1 Linden Street	71.5	76.8	77.9	Exceeds NAC	78.7	78.9	80.2	79.5	Moderate
CS-3	326 Cambridge Street	69.8	70.7	73.3	Exceeds NAC	76.5	76.8	78.6	75.0	No Impact
CS-4	1 Harvard Avenue	64.6	61.8	66.4	Exceeds NAC	70.2	71.2	72.9	68.3	No Impact
CS-5	3 Linden Street	63.8	66.4	68.3	Exceeds NAC	68.1	69.2	71.1	70.0	Moderate
CS-6	15 Linden Street	51.5	61.9	62.2	Below NAC	62.7	64.4	66.9	63.9	No Impact
AV-1	18 Sawyer Terrace	61.9	79.8	79.8	Exceeds NAC	81.2	81.3	82.1	81.2	No Impact
AV-2	10 Wadsworth Street	64.0	80.3	80.4	Exceeds NAC	81.3	81.4	82.2	81.8	Moderate
AV-3	30 Pratt Street	65.4	71.9	72.8	Exceeds NAC	74.0	74.4	76.2	74.4	No Impact
AV-4	18 Pratt Street	63.1	62.4	65.8	Exceeds NAC	68.7	69.8	71.7	67.6	No Impact
AV-5	9 Sawyer Terrace	57.0	67.1	67.5	Exceeds NAC	68.3	69.4	71.2	69.0	No Impact
AV-6	11 Wadsworth Street	58.6	66.3	67.0	Exceeds NAC	68.0	69.1	71.0	68.6	No Impact
AV-7	33 Pratt Street	58.5	61.9	63.5	Below NAC	65.4	66.7	68.9	65.3	No Impact
AV-8	72 Ashford Street	53.0	61.7	62.2	Below NAC	63.2	64.8	67.3	63.8	No Impact
AV-9	New Balance Field	50.0	58.0	58.7	Below NAC	56.5*	62.3*	67.2*	58.7*	No Impact
AV-10	Malvern Softball	50.4	59.5	60.0	Below NAC	58.7*	63.7*	68.3*	60.0*	No Impact
AV-11	53 Ashford Street	53.5	55.0	57.3	Below NAC	60.3	62.2	65.2	59.1	No Impact
AV-12	18 Ashford Street	54.0	57.2	58.9	Below NAC	61.1	63.0	65.8	60.7	No Impact

** Leq noise levels used to assess noise at FTA Category 3 land use*


LINCOLN STREET
90
CAMBRIDGE STREET
BRAINTREE STREET
WILTON STREET
FRANKLIN STREET
HIGHGATE STREET
PRATT STREET
WADSWORTH STREET
ASHFORD COURT
HARTLEY TERRACE
SAWYER TERRACE
ASHFORD STREET
CS-1
CS-2
CS-3
CS-4
CS-5
CS-6
AV-1
AV-2
AV-3
AV-4
AV-5
AV-6
AV-7
AV-8
DESIGN YEAR NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
Proposed Roadway (at-grade)
Proposed Open Space and/or Landscaped Median

[redacted]

Graphic 5.11-3: Design Year Noise Levels Prior to Abatement, Allston Village & Pratt Street/Wadsworth Street Area

Noise Abatement Evaluation in Allston Village and the Pratt Street/Wadsworth Street Area

Noise abatement has been evaluated according to the MassDOT noise policy, including the evaluation of a potential noise wall that would be located along the railroad ROW. Based on the preliminary design of the noise wall, it would be expected to be feasible in regard to engineering factors such as safety, avoiding conflicts with utilities, providing adequate line of sight to the train engineer, and ability to be maintained.

A wall along the rail ROW will be effective at reducing noise from both train and highway sources. Noise walls ranging in height between 12 and 24 feet were evaluated to determine acoustical and cost effectiveness and to identify a preliminary noise barrier design including recommended height and location. The predominant noise source in the area will be train operations and noise generated by the locomotive exhaust and cooling fans on top of the locomotive. Therefore, the noise wall needs to be sufficiently tall to reduce noise from these sources and set 15 feet above the top of the rail.

An 18-foot-tall, 1,400-foot-long noise wall between the proposed West Station at Malvern Street and a warehouse at 22 Pratt Street will provide substantial noise reduction to the community. The noise wall will not need to extend farther west towards Cambridge Street because receptors in that area have substantial contributions of noise from roadway sources that would not be attenuated by a noise wall. Moreover, the Our Future Learning Center (CS-1) has an existing solid fence along the edge of its building that protects the areas of outdoor use. Extension of a noise wall along this area offers no substantial additional mitigation.

As shown in Table 5.11-5, the proposed noise wall will reduce noise up to 12 dBA at first-row receptors and 5 to 8 dBA at second-row receptors. With the noise wall, loudest-hour noise levels will generally be reduced from 80 dBA to 68 dBA (Leq) in the first-row. Graphic 5.11-4 presents the with-barrier noise conditions in Allston Village and the Pratt Street/Wadsworth Street Area.

Table 5.11-5: Noise Levels Modeled with and without Abatement – Allston Village and the Pratt Street/Wadsworth Street Area – All Variations

Receptor Number	Location	Design Year Build Loudest-Hour Noise Level (Leq, dBA)		
		Without Noise Wall	With Noise Wall	Noise Reduction
AV-1	18 Sawyer Terrace	79.8	68.5	11.4
AV-2	10 Wadsworth Street	80.4	68.4	12.1
AV-3	30 Pratt Street	72.8	64.9	7.9
AV-4	18 Pratt Street	65.8	60.3	5.5
AV-5	9 Sawyer Terrace	67.5	60.8	6.7
AV-6	11 Wadsworth Street	67.0	60.3	6.7
AV-7	33 Pratt Street	63.5	59.0	4.5
AV-8	72 Ashford Street	62.2	57.5	4.7
AV-9	New Balance Field	58.7	58.7	0.0
AV-10	Malvern Softball	60.0	60.0	0.0
AV-11	53 Ashford Street	57.3	54.1	3.3
AV-12	18 Ashford Street	58.9	55.2	3.7

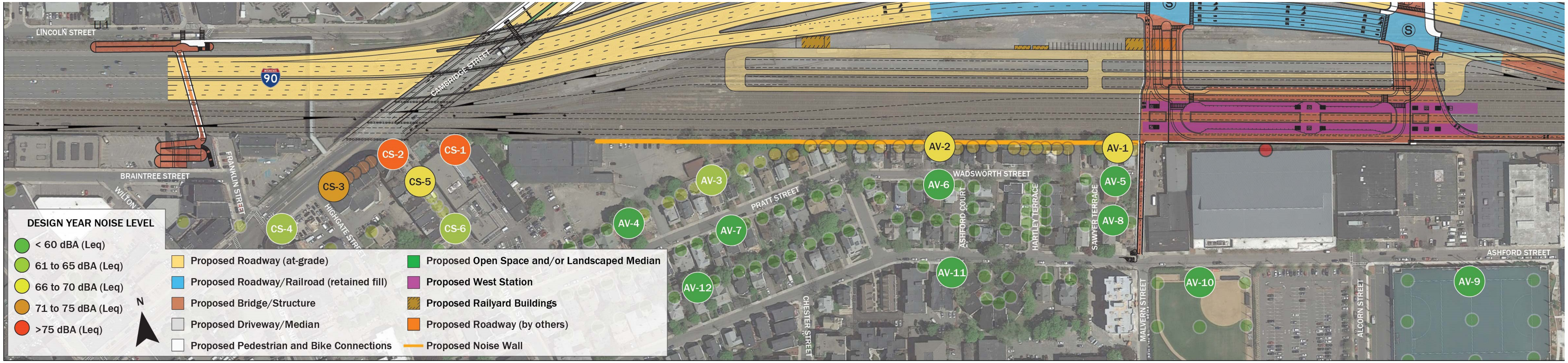
Source: MassDOT, 2017

Table 5.11-6 summarizes the acoustical and cost effectiveness of the proposed noise wall. The noise wall will benefit (provide 5 decibels or more of noise reduction) to 70 dwelling units, cost approximately $1,260,000 (based on $50 per square foot), and provide an average of 8.4 dB of noise reduction to benefited receptors. The noise wall CEI will be $2,050, which is well below the MassDOT criterion of $8,400. Therefore, this noise barrier would be considered feasible and reasonable according to MassDOT noise policy, will be considered likely to be constructed, and is therefore considered to be part of the Project. As part of the process to determine the reasonableness of the wall, the viewpoints of benefited receptors will be solicited to determine their interests in constructing the noise wall.

Table 5.11-6: Proposed Noise Wall at Pratt Street and Wadsworth Street

Receptor Number	Result
Noise Wall Length (ft)	1,400
Noise Wall Height (ft)	18
Noise Wall Cost ($50/SF)	$1,260,000
Number of Impacted Receptors in Barrier Area	60
Number of Benefited Receptors (Dwelling Units)	70
Average Noise Reduction (dBA)	8.4
Maximum Noise Reduction (dBA)	12.6
Category B Cost Effectiveness Index Criterion	$8,400
Feasible and Reasonable	Yes

Source: MassDOT, 2017


LINCOLN STREET
90
CAMBRIDGE STREET
BRAINTREE STREET
WILTON
FRANKLIN STREET
HIGHGATE STREET
PRATT STREET
WADSWORTH STREET
ASHFORD COURT
HARTLEY TERRACE
SAWYER TERRACE
CHESTER STREET
MALVERN STREET
ALCORN STREET
ASHFORD STREET
CS-1
CS-2
CS-3
CS-4
CS-5
CS-6
AV-1
AV-2
AV-3
AV-4
AV-5
AV-6
AV-7
AV-8
AV-9
AV-10
AV-11
AV-12
N
DESIGN YEAR NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
66 to 70 dBA (Leq)
71 to 75 dBA (Leq)
>75 dBA (Leq)
Proposed Roadway (at-grade)
Proposed Roadway/Railroad (retained fill)
Proposed Bridge/Structure
Proposed Driveway/Median
Proposed Pedestrian and Bike Connections
Proposed Open Space and/or Landscaped Median
Proposed West Station
Proposed Railyard Buildings
Proposed Roadway (by others)
Proposed Noise Wall

Graphic 5.11-4 Design Year Noise Levels with Abatement - Allston Village & Pratt Street/Wadsworth Street Area

5.11.5.2 Boston University Area

The three Throat Area Variations will have different effects on future noise conditions in the BU area. All variations will realign I-90 closer to Nickerson Field at BU. The following describes other effects on noise conditions in the BU area for each variation:

- **3K-HV Variation:** This variation will keep I-90 elevated similar to existing conditions. The elevated highway will provide acoustic shielding to ground-level receptors, especially for those close to the viaduct. Noise from train operations will be similar to existing conditions, and the existing retaining wall along Nickerson Field will continue to provide similar acoustic shielding to trains. This variation will introduce new track turnouts near the College of Fine Arts, the College of General Studies and 10 Buick Street. The track turnouts will increase noise because they introduce a gap in the rail running surface that the train wheels impact.
- **3K-ABC Variation:** This variation will relocate I-90 to the existing ground level through the BU area. With I-90 at existing ground level, there will be a loss of acoustic shielding that is provided by the existing viaduct. The realignment of the GJR tracks will include a retaining wall for the tracks to span over I-90 and SFR towards the GJR Bridge. This retaining wall will provide acoustic shielding from the highway for buildings such as the College of Fine Arts. The Worcester Main Line tracks will be relocated closer to Buick Street, which will slightly increase noise at receptors on Buick Street. The existing retaining wall along Nickerson Field will continue to provide similar acoustic shielding from train noise compared to existing conditions. This variation will introduce new track turnouts near 10 Buick Street.
- **3K-AMP Variation:** This variation will lower I-90 approximately 8 feet below the current ground elevation near Nickerson Field and will transition back to the existing ground elevation by the BU Bridge. The GJR tracks will be on an elevated guideway above I-90, and the Worcester Main Line tracks will be shifted closer to Buick Street and lowered by up to 10 feet near Nickerson Field. With the lower rail alignment, the existing retaining wall along Nickerson Field will provide greater acoustic shielding from trains compared to existing conditions. With I-90 below the existing ground level, there will be a loss of acoustic shielding to ground-level receptors compared to the existing viaduct. This variation will introduce new track turnouts near the College of Fine Arts, College of General Studies and 10 Buick Street.

Table 5.11-7 through Table 5.11-9 present the Design Year Build Leq and the relative contributions from roadway and train noise sources for the 3K-HV, 3K-ABC and 3K-AMP Variations, respectively. Since the school buildings and the dormitory at 33 Agganis Way do not have outdoor areas of frequent human use, such as balconies, noise levels (Leq) were evaluated according to the interior MassDOT NAC (52 dBA). Based on the construction materials and the type of windows, the buildings were assumed to reduce interior noise levels by 35 decibels. The tables also present existing and Design Year day-night average noise levels (Ldn) and the assessment of potential noise impact according to FTA criteria. The FTA noise impact criteria were only applied at exterior locations.

Table 5.11-7: 2040 Noise Impact Assessment Results – Boston University – 3K-HV Variation

Receptor Number	Location	Design Year Build Loudest-Hour Noise Level (Leq, dBA)					Day-Night Average Noise Level (Ldn, dBA)			FTA Noise Impact Assessment
		Road Sources	Train Sources	Total (Interior)	MassDOT NAC Assessment	Existing	FTA Impact Criteria		Design Year Build	
							Moderate	Severe		
BU-1	College of Fine Arts	67.3	87.5	87.5 (52.5)*	Exceeds Interior NAC	79.4*	79.9	82.7	87.5*	Severe
BU-2	College of General Studies	68.3	79.0	79.4 (44.4)*	Below Interior NAC	73.1*	74.8	78.3	79.4*	Severe
BU-3	10 Buick Street (Dormitory)	69.7	70.6	73.2	Exceeds NAC	72.5	73.1	74.9	74.9	Severe
BU-4	33 Agganis Way (Dormitory)	69.3	64.5	70.5 (35.5)*	No Exterior Use	75.2	75.5	77.3	72.4	No Impact
BU-5	Nickerson Field	64.0	73.6	74.0	Exceeds NAC	74.6*	75.8	79.5	74.0**	No Impact
BU-6	Nutrition Department	64.5	60.8	66.1 (31.1)*	Below Interior NAC	64.8*	68.3	72.0	66.1*	No Impact
BU-7	Fitness & Recreation Center	64.6	59.6	65.8 (30.8)*	Below Interior NAC	65.9*	69.1	72.7	65.8*	No Impact
BU-8	Agganis Arena	67.1	60.2	67.9 (32.9)*	Below Interior NAC	68.0*	71.0	74.3	67.9*	No Impact
BU-9	Nickerson Field	65.8	66.3	69.1	Exceeds NAC	68.2*	71.0	74.4	69.1*	No Impact
BU-10	Nickerson Field	63.6	63.0	66.3	Below NAC	65.3*	68.7	72.3	66.3*	No Impact

Table 5.11-8: 2040 Noise Impact Assessment Results – Boston University – 3K-ABC Variation

Receptor Number	Location	Design Year Build Loudest-Hour Noise Level (Leq, dBA)					Day-Night Average Noise Level (Ldn, dBA)			FTA Noise Impact Assessment
		Road Sources	Train Sources	Total (Interior)	MassDOT NAC Assessment	Existing	FTA Impact Criteria		Design Year Build	
							Moderate	Severe		
BU-1	College of Fine Arts	70.0	83.6	83.8 (48.8)*	Below Interior NAC	79.4*	79.9	82.7	83.8*	Severe
BU-2	College of General Studies	69.0	81.6	81.8 (46.8) *	Below Interior NAC	73.1*	74.8	78.3	81.8*	Severe
BU-3	10 Buick Street (Dormitory)	73.6	73.0	76.3	Exceeds NAC	72.5	73.1	74.9	78.1	Severe
BU-4	33 Agganis Way (Dormitory)	75.8	66.5	76.3 (41.3)*	No Exterior Use	75.2	75.5	77.3	78.2	Severe
BU-5	Nickerson Field	71.9	79.1	79.8	Exceeds NAC	74.6*	75.8	79.5	79.8*	Severe
BU-6	Nutrition Department	58.7	62.4	64.0 (29.0)*	Below Interior NAC	64.8*	68.3	72.0	64.0*	No Impact
BU-7	Fitness & Recreation Center	62.7	60.8	64.9 (29.9)*	Below Interior NAC	65.9*	69.1	72.7	64.9*	No Impact
BU-8	Agganis Arena	64.3	60.5	65.8 (30.8)*	Below Interior NAC	68.0*	71.0	74.3	65.8*	No Impact
BU-9	Nickerson Field	63.6	67.7	69.1	Exceeds NAC	68.2*	71.0	74.4	69.1*	No Impact
BU-10	Nickerson Field	59.5	63.8	65.2	Exceeds NAC	65.3*	68.7	72.3	65.2*	No Impact

Table 5.11-9: 2040 Noise Impact Assessment Results – Boston University – 3K-AMP Variation

Receptor Number	Location	Design Year Build Loudest-Hour Noise Level (Leq, dBA)					Day-Night Average Noise Level (Ldn, dBA)			FTA Noise Impact Assessment
		Road Sources	Train Sources	Total (Interior)	MassDOT NAC Assessment	Existing	FTA Impact Criteria		Design Year Build	
							Moderate	Severe		
BU-1	College of Fine Arts	76.6	83.8	84.6 (49.6)*	Below Interior NAC	79.4*	79.9	82.7	84.6*	Severe
BU-2	College of General Studies	71.2	78.6	79.3 (44.3)*	Below Interior NAC	73.1*	74.8	78.3	79.3*	Severe
BU-3	10 Buick Street (Dormitory)	73.7	71.6	75.8	Exceeds NAC	72.5	73.1	74.9	77.6	Severe
BU-4	33 Agganis Way (Dormitory)	72.0	64.5	72.7 (37.7)*	No Exterior Use	75.2	75.5	77.3	74.7	No Impact
BU-5	Nickerson Field	72.8	68.6	74.2	Exceeds NAC	74.6*	75.8	79.5	74.2*	No Impact
BU-6	Nutrition Department	61.9	60.6	64.3 (29.3)*	Below Interior NAC	64.8*	68.3	72.0	64.3*	No Impact
BU-7	Fitness & Recreation Center	59.1	59.6	62.4 (27.4)*	Below Interior NAC	65.9*	69.1	72.7	62.4*	No Impact
BU-8	Agganis Arena	61.6	58.4	63.3 (28.3)*	Below Interior NAC	68.0*	71.0	74.3	63.3*	No Impact
BU-9	Nickerson Field	63.0	64.6	66.9	Exceeds NAC	68.2*	71.0	74.4	66.9*	No Impact
BU-10	Nickerson Field	58.3	62.8	64.1	Below NAC	65.3*	68.7	72.3	64.1*	No Impact

** Leq noise levels used to assess noise at FTA Category 3 land use*

Graphics 5.11-5 through Graphic 5.11-7 present the Design Year noise levels in the BU area prior to abatement for the 3K-HV, 3K-ABC and 3K-AMP Variations, respectively. The following summarizes the interior noise levels (Leq) that would be experienced in BU school buildings for each Throat Area Variation:

- 3K-HV: Interior noise levels will range from 31 to 53 dBA
- 3K-ABC: Interior noise levels will range from 29 to 49 dBA
- 3K-AMP: Interior noise levels will range from 27 to 50 dBA

Interior noise levels would be slightly higher for the 3K-HV and 3K-AMP Variations primarily due to the increased noise from rail turnouts that will be near the College of Fine Arts and the College of General Studies.

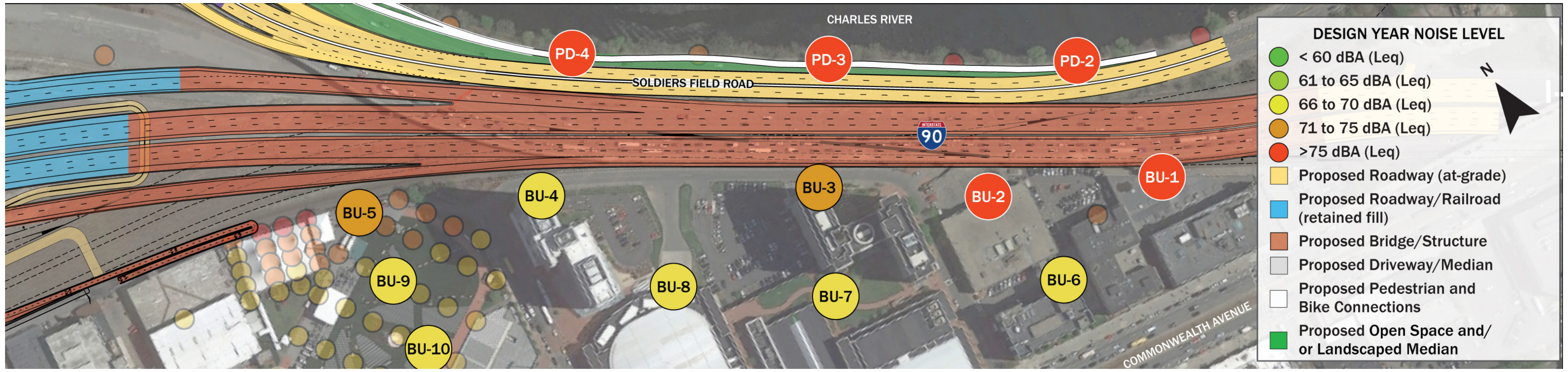
The following summarizes the exterior noise levels (Leq) at Nickerson Field for each Throat Area Variation:

- 3K-HV: Exterior noise levels will range from 66 to 74 dBA
- 3K-ABC: Exterior noise levels will range from 65 to 80 dBA
- 3K-AMP: Exterior noise levels will range from 64 to 74 dBA

Noise levels at Nickerson Field will be lowest for the 3K-AMP Variation because the Worcester Main Line will be up to 9 feet lower than it would be for the other variations and there would be greater noise reduction provided by the existing retaining wall between Nickerson Field and the rail ROW. Highway noise at Nickerson Field will be highest for the 3K-ABC Variation because the 3K-HV Variation provides acoustic shielding from the elevated highway and the 3K-AMP Variation provides some acoustic shielding from the more depressed roadway alignment.

The impact assessment results show that Design Year noise levels (Leq) will exceed the exterior NAC (67 dBA) at the 10 Buick Street dormitory and Nickerson Field for all Throat Area Variations. Interior noise levels at the College of Fine Arts will exceed the interior NAC (52 dBA) for 3K-HV primarily due to the increased noise from track turnouts near the building. There will be no interior noise impact for the 3K-ABC or 3K-AMP Variation.

The FTA noise impact assessment shows that there will be severe noise impact at the College of Fine Arts, College of General Studies and the 10 Buick Street dormitory for all three Throat Area Variations. There will also be severe noise impact at the 33 Agganis Way dormitory and Nickerson Field for the 3K-ABC Variation.


CHARLES RIVER
SOLDIERS FIELD ROAD
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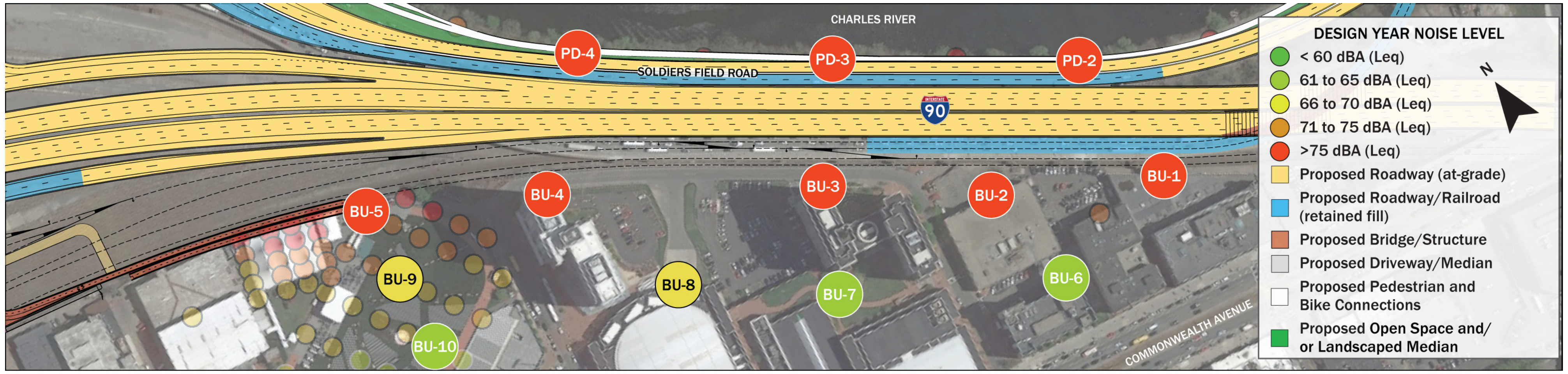
BU-5
BU-6
BU-7
BU-8
BU-9
BU-10
COMMONWEALTH AVENUE
N
DESIGN YEAR NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
66 to 70 dBA (Leq)
71 to 75 dBA (Leq)
>75 dBA (Leq)
Proposed Roadway (at-grade)
Proposed Roadway/Railroad (retained fill)
Proposed Bridge/Structure
Proposed Driveway/Median
Proposed Pedestrian and Bike Connections
Proposed Open Space and/or Landscaped Median

Graphic 5.11-5 Design Year Noise Levels at Boston University Prior to Abatement – 3K-HV Variation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SOLDIERS FIELD ROAD
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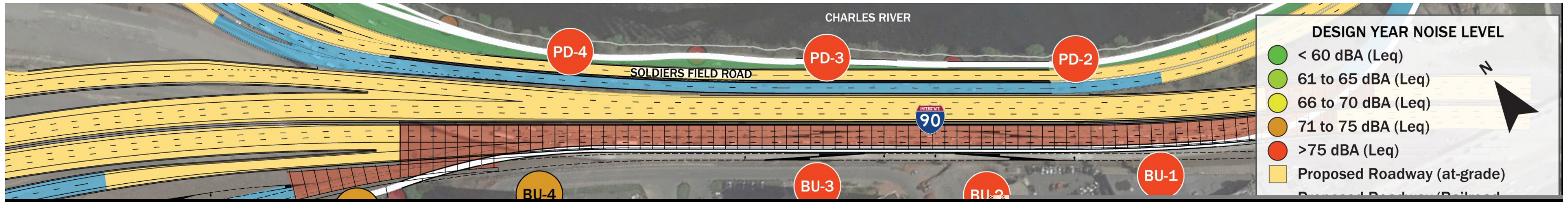
BU-5
BU-6
BU-7
BU-8
BU-9
BU-10
COMMONWEALTH AVENUE
N
DESIGN YEAR NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
66 to 70 dBA (Leq)
71 to 75 dBA (Leq)
>75 dBA (Leq)
Proposed Roadway (at-grade)
Proposed Roadway/Railroad (retained fill)
Proposed Bridge/Structure
Proposed Driveway/Median
Proposed Pedestrian and Bike Connections
Proposed Open Space and/or Landscaped Median

Graphic 5.11-6 Design Year Noise Levels at Boston University Prior to Abatement – 3K-ABC Variation


CHARLES RIVER
SOLDIERS FIELD ROAD
PD-4
PD-3
PD-2
90
BU-1
BU-3
BU-4
DESIGN YEAR NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
66 to 70 dBA (Leq)
71 to 75 dBA (Leq)
>75 dBA (Leq)
Proposed Roadway (at-grade)

Graphic 5.11-7 Design Year Noise Levels at Boston University Prior to Abatement – AMP Variation

Noise Abatement Evaluation in Boston University Area

Since noise levels will exceed the NAC, abatement must be considered. To mitigate noise impact at the College of Fine Arts for the 3K-HV Variation, it will be most effective to reduce noise associated with the new track turnout. Relocating the track turnout away from sensitive receptors or using a specific turnout design will be effective at mitigating noise impact. Certain types of track turnouts close the gap in the rail running surface and minimize noise and vibration. These turnouts include moveable or spring-loaded parts, and will be effective in reducing noise below the NAC.

Since exterior noise levels at 10 Buick Street and Nickerson Field will exceed the NAC, abatement, such as noise walls, must be considered. The dormitory at 10 Buick Street includes an existing solid wood wall approximately 9 feet tall surrounding the ground-level area of outdoor human use. This existing wall reduces noise from both highway and train sources, particularly sources that are or will be at ground-level.

For the 3K-HV Variation, two separate noise walls will be needed to attenuate sound at ground-level receptors: an at-grade wall along the rail ROW to reduce train noise, and a wall on the elevated highway viaduct. For the 3K-AMP and 3K-ABC Variations, only a single at-grade wall will be needed to reduce noise from both sources. The acoustical and cost effectiveness of noise walls ranging from 8 to 24 feet were evaluated. The results of the evaluation indicate that even with a 24-foot noise wall, less than 5 decibels of noise reduction will be achieved at 10 Buick Street due to the noise reduction already provided by the solid wood wall. Therefore, a noise wall will not be acoustically effective for 10 Buick Street.

To mitigate potential noise impact at Nickerson Field, the acoustical and cost effectiveness of noise walls ranging from 8 to 24 feet were evaluated. Similar to the evaluation at 10 Buick Street, two walls were considered for reducing noise for the 3K-HV Variation and a single at-grade wall was considered for the 3K-AMP and 3K-ABC Variations. The results of the evaluation indicate that a 12-foot-tall noise wall approximately 650-feet-long that will be constructed on top of the existing retaining wall, as well as an 8-foot-tall noise wall constructed as an extension of the highway viaduct parapet wall for 3K-HV, will provide substantial noise reduction throughout most of Nickerson Field for all three Throat Area Variations. As currently designed, there will be a potential conflict with pedestrian access to West Station from the end of Agganis Way.

Table 5.11-10 through Table 5.11-12 present representative noise levels with and without the noise wall at Nickerson Field for the 3K-HV, 3K-ABC and 3K-AMP Variations, respectively. These tables show that the proposed noise walls will reduce noise at Nickerson Field by 6 to 8 dBA for 3K-HV, from 5 to 11 dBA for 3K-ABC and 5 to 6 dBA for 3K-AMP. The noise wall for 3K-AMP will provide less noise reduction than the other variations because the existing retaining wall already provides substantial noise reduction, which an added noise wall will improve. Graphics 5.11-8 through 5.11-10 present the Design Year noise levels with mitigation at BU's Nickerson Field for the 3K-HV, 3K-ABC and 3K-AMP Variations, respectively.

Table 5.11-10: 2040 Noise Levels Modeled with and without Abatement – Nickerson Field – 3K-HV Variation

		Design Year Build Loudest-Hour Noise Level (Leq, dBA)		
Receptor Number	Location	Without Noise Wall	With Noise Walls	Noise Reduction
BU-5	Nickerson Field	74.0	66.1	7.9
BU-9	Nickerson Field	69.1	62.5	6.6
BU-10	Nickerson Field	66.3	60.2	6.1

Source: MassDOT, 2017

Table 5.11-11: 2040 Noise Levels Modeled with and without Abatement – Nickerson Field – 3K-ABC Variation

		Design Year Build Loudest-Hour Noise Level (Leq, dBA)		
Receptor Number	Location	Without Noise Wall	With Noise Walls	Noise Reduction
BU-5	Nickerson Field	79.8	69.3	10.5
BU-9	Nickerson Field	69.1	63.3	5.8
BU-10	Nickerson Field	65.2	60.4	4.8

Source: MassDOT, 2017

Table 5.11-12: 2040 Noise Levels Modeled with and without Abatement – Nickerson Field – 3K-AMP Variation

		Design Year Build Loudest-Hour Noise Level (Leq, dBA)		
Receptor Number	Location	Without Noise Wall	With Noise Walls	Noise Reduction
BU-5	Nickerson Field	74.2	67.8	6.4
BU-9	Nickerson Field	66.9	61.8	5.1
BU-10	Nickerson Field	64.1	58.9	5.2

Source: MassDOT, 2017

For Activity Category C land use, such as Nickerson Field, the CEI of noise walls depends on the amount of human use that typically occurs. There are numerous activities at Nickerson Field such as soccer and lacrosse practices, games and clinics; intramural sports; general recreational uses; commencement; a multiple sclerosis walk event; and tennis. The MassDOT CEI criterion for Activity Category C land use is $138 per decibel of noise reduction per person per hour of use. This is equivalent to the cost allowance for residential receptors taking into consideration the average number of people per dwelling unit and the amount of time people spend at residences. Use of Nickerson Field was based on a detailed schedule of events provided by BU.

Tables 5.11-13 through 5.11-15 summarize the acoustical and cost effectiveness of the proposed noise walls for each variation. The average noise reduction for benefited receptors in Nickerson Field is 6 to 7 dBA for all Throat Area Variations. The mitigation evaluation determined that a 650-foot-long, 12-foot-tall noise wall (including two 650-foot noise walls for the HV Variation) will have a CEI of $114, $60 or $63 for Variations 3K-HV, 3K-ABC and 3K-AMP, respectively. The CEI will be less than the MassDOT criterion of $138 for all variations.

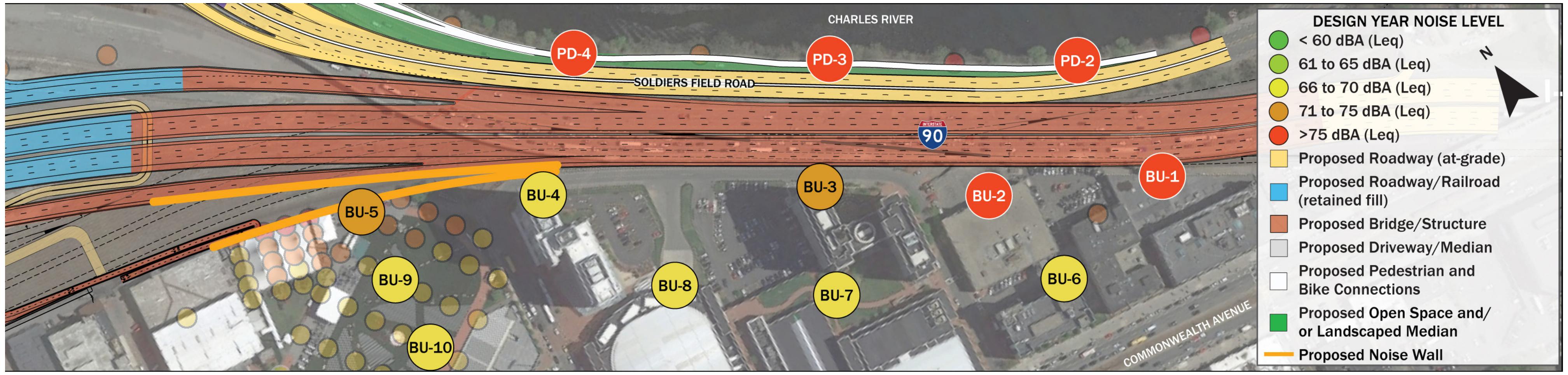
It should be noted that the reported noise reduction is based on the incremental increase relative to the noise reduction already provided by the retaining wall. Since the overall noise reduction of the retaining wall and noise walls is higher than the incremental increase, these noise barriers are considered to be acoustically effective as they relate to meeting the noise reduction design goal.

Therefore, noise walls to benefit Nickerson Field will be considered feasible and reasonable for each Throat Area Variation according to MassDOT noise policy and will be considered likely to be constructed. As part of the process to determine the reasonableness of the wall, the viewpoints of BU officials will be solicited to determine their interests in constructing the noise wall.

Table 5.11-13: Proposed Noise Walls at Nickerson Field 3K-HV Variation

Description	Result
Noise Wall Length (ft)	2 x 650
Noise Wall Height (ft)	12 (at-grade); 8 (viaduct)
Noise Wall Cost ($50/SF)	$750,000
Number of Benefited Persons	400
Average Hours of Use per Person	2.4
Average Noise Reduction (dBA)	6.8
Maximum Noise Reduction (dBA)	8.8
Category C Cost Effectiveness Index Criterion	$138
Feasible and Reasonable	Yes

Source: MassDOT, 2017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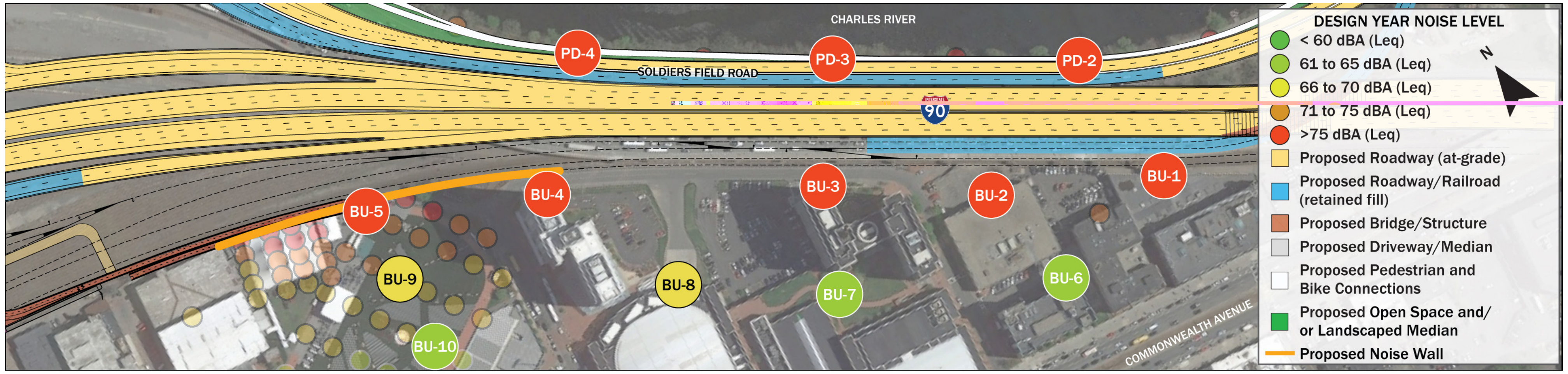
BU-10
DESIGN YEAR NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
66 to 70 dBA (Leq)
71 to 75 dBA (Leq)
>75 dBA (Leq)
Proposed Roadway (at-grade)
Proposed Roadway/Railroad (retained fill)
Proposed Bridge/Structure
Proposed Driveway/Median
Proposed Pedestrian and Bike Connections
Proposed Open Space and/ or Landscaped Median
Proposed Noise Wall

Graphic 5.11-8: Design Year Noise Levels at Boston University With Abatement – 3K-HV Variation

Table 5.11-14: Proposed Noise Wall at Nickerson Field 3K-ABC Variation

Description	Result
Noise Wall Length (ft)	650
Noise Wall Height (ft)	12
Noise Wall Cost ($50/SF)	$300,000
Number of Benefited Persons	284
Average Hours of Use per Person	2.4
Average Noise Reduction (dBA)	7.4
Maximum Noise Reduction (dBA)	10.9
Category C Cost Effectiveness Index Criterion	$138
Feasible and Reasonable	Yes

Source: MassDOT, 2017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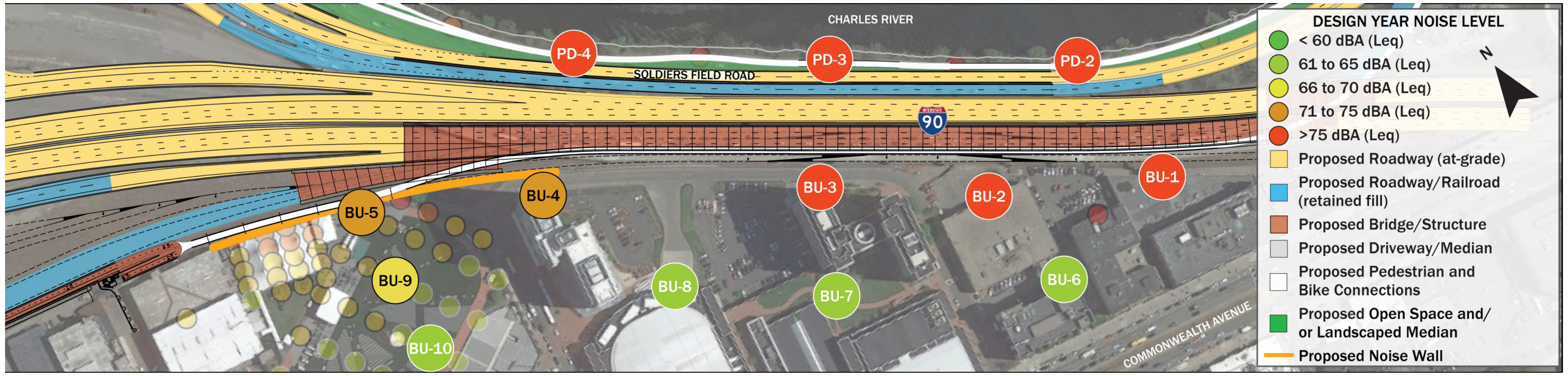
BU-9
BU-10
DESIGN YEAR NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
66 to 70 dBA (Leq)
71 to 75 dBA (Leq)
>75 dBA (Leq)
Proposed Roadway (at-grade)
Proposed Roadway/Railroad (retained fill)
Proposed Bridge/Structure
Proposed Driveway/Median
Proposed Pedestrian and Bike Connections
Proposed Open Space and/ or Landscaped Median
Proposed Noise Wall

Graphic 5.11-9: Design Year Noise Levels at Boston University With Abatement – 3K-ABC Variation

Table 5.11-15: Proposed Noise Wall at Nickerson Field 3K-AMP Variation

Description	Result
Noise Wall Length (ft)	650
Noise Wall Height (ft)	12
Noise Wall Cost ($50/SF)	$300,000
Number of Benefited Persons	340
Average Hours of Use per Person	2.4
Average Noise Reduction (dBA)	5.8
Maximum Noise Reduction (dBA)	7.8
Cost Effectiveness Index ($/dBIL/person/hour)	$63
Category C Cost Effectiveness Index Criterion	$138
Feasible and Reasonable	Yes

Source: MassDOT, 2017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BU-8
BU-9
BU-10
DESIGN YEAR NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
66 to 70 dBA (Leq)
71 to 75 dBA (Leq)
>75 dBA (Leq)
Proposed Roadway (at-grade)
Proposed Roadway/Railroad (retained fill)
Proposed Bridge/Structure
Proposed Driveway/Median
Proposed Pedestrian and Bike Connections
Proposed Open Space and/ or Landscaped Median
Proposed Noise Wall

Graphic 5.11-10: Design Year Noise Levels at Boston University With Abatement – 3K-AMP Variation

5.11.5.3 Paul Dudley White Path, Magazine Beach, Cambridgeport and Riverside

Design Year noise levels were evaluated for all three Throat Area Variations at the PDW Path, Magazine Beach, Cambridgeport and Riverside. Table 5.11-16 presents the No Build (2040) and Design Year noise levels at receptors on the PDW Path, Magazine Beach, Cambridgeport and Riverside for all three Throat Area Variations. The noise impact assessment results are presented in Tables 5.11-17 through 5.11-19 and Graphics 5.11-11 through 5.11-13 for the 3K-HV, 3K-ABC and 3K-AMP Variations, respectively.

Noise from train operations will be similar (within 1 decibel) for all Throat Area Variations. MBTA train operations on the Worcester Main Line will be the predominant source of train noise, and the Worcester Main Line tracks will generally be in the same location relative to receptors in Cambridge for all three variations. For the 3K-AMP Variation, the GJR tracks will be on an elevated guideway that will generate additional radiated noise from the vibration of the structure. Freight trains on the GJR tracks; however, are typically 15 decibels quieter than Worcester Main Line operations due to the substantially fewer number of train operations, so they do not contribute significantly to overall noise levels. Similarly, MBTA mid-day layover train movements into the rail yard, including the potential idling of locomotives (up to 30 minutes), will be approximately 15 decibels quieter than from MBTA trains on the Worcester Main Line.

Paul Dudley White Path

For all Throat Area Variations, the predominant noise source on the PDW Path will be traffic from SFR due to its close proximity. In the Throat Area, there will also be substantial noise from traffic on I-90. Train noise will be typically 5 to 10 decibels below roadway noise sources on the PDW Path. Near the proposed SFR underpass at Cambridge Street South, noise levels on the PDW Path will be approximately 8 to 13 decibels lower than in the Throat Area due to the shifting of SFR farther away from the path, the acoustic shielding provided by the retaining walls for the underpass and the fact I-90 will be farther away for all Throat Area Variations. The following summarizes results in the Throat Area for each variation:

- **3K-HV Variation:** This variation will increase the distance between SFR and the PDW Path in the Throat Area resulting in design year noise levels that will be approximately 2 to 3 dB lower than the No Build condition. This variation will keep I-90 elevated similar to existing conditions, which provides acoustic shielding to ground-level receptors, especially those close to the viaduct.
- **3K-ABC Variation:** This variation will relocate I-90 to the existing ground level through the Throat Area, increase the elevation of SFR eastbound, shift the Worcester Main Line tracks farther from the PDW Path and increase the elevation of the GJR tracks. Noise levels on the PDW Path in the Throat Area will be approximately 0 to 1 dB lower relative to the No Build condition. Noise levels will not change substantially due to a combination of effects. Lowering I-90 will increase noise due to the loss of acoustic shielding provided by the elevated highway while increasing the elevation of SFR eastbound will introduce new acoustic shielding for I-90. Train noise will be reduced slightly due to the shifting of the Worcester Main Line tracks farther from the PDW path and the increased elevation of the GJR tracks that will introduce acoustic shielding. Compared to the 3K-HV Variation, noise levels on the PDW Path will be up to 2 decibels higher with this variation.
- **3K-AMP Variation:** This variation will lower I-90 approximately 8 feet below the current ground elevation along Nickerson Field and transition back to existing ground elevation within the Throat Area. GJR will be relocated onto an elevated guideway and the Worcester Main Line tracks will be relocated farther from the PDW Path. There will be a loss of acoustic shielding that is provided by the viaduct, and noise levels will be higher than existing conditions. Similar to the 3K-ABC Variation, SFR eastbound will be elevated. Noise levels on the PDW Path in the Throat Area will be approximately 1 to 2 dB lower relative to the No Build condition due to a combination of effects. Lowering I-90 will increase noise due to the loss of acoustic shielding provided by the elevated highway. Increasing the elevation of SFR eastbound will introduce new acoustic shielding for I-90, and the realignment of SFR approximately 15 feet farther away from the PDW Path will reduce noise levels. Train noise will be reduced slightly due to the shifting of the Worcester Main Line tracks farther from the PDW Path, and shielding from the elevated SFR eastbound. Compared to the 3K-HV Variation, noise levels on the PDW Path will be up to 1 decibel higher with this variation.

Magazine Beach Area

The predominant noise sources at Magazine Beach include traffic on SFR, I-90 and Memorial Drive. Since SFR and I-90 will be more than 500 feet away from Magazine Beach, noise from Memorial Drive will represent the most significant noise source, particularly for receptors in the northern portion of Magazine Beach.

- **3K-HV Variation:** This variation will shift SFR slightly farther away from Magazine Beach. For receptors 500 feet and farther from the roadway, this change to the horizontal alignment will have a minimal effect on noise. Although less pronounced than for receptors at PDW Path, the elevated highway will provide more acoustic shielding from I-90 for receptors in Magazine Beach and Cambridgeport compared to the 3K-ABC and 3K-AMP Variations. Specifically, the proposed 3.5-foot parapet wall on the edge of the I-90 viaduct will block the line of sight to the tire/pavement noise sources and many of the vehicle engine/car body sources.
- **3K-ABC Variation:** Noise levels will not change substantially (0 to 1 dB) in Magazine Beach relative to the No Build condition due to a combination of effects including the loss of acoustic shielding provided by the elevated highway and the introduction of new acoustic shielding for I-90 due to the elevation of SFR eastbound. Compared to the 3K-HV Variation, noise levels in Magazine Beach will be up to 2 decibels higher with the 3K-ABC Variation.
- **3K-AMP Variation:** Noise levels will be approximately 1 to 3 dB lower in Magazine Beach relative to the No Build condition due to a combination of effects including the loss of acoustic shielding provided by the elevated highway, the introduction of new acoustic shielding for I-90 due to the elevation of SFR eastbound, and the realignment of SFR slightly farther from Magazine Beach. Noise levels in Magazine Beach will be similar for the 3K-HV and 3K-AMP Variations.

Noise levels with the Project will still exceed the FHWA NAC along portions of the PDW Path in the Throat Area and portions of Magazine Beach for all variations, but the noise levels will not increase by more than 3 dBA compared to the No Build condition. Therefore, the Project will not result in a constructive use of Section 4(f) properties due to noise for any variation. See the Section 4(f) evaluation for further information.

Cambridgeport and Riverside Areas

The predominant noise sources in Cambrideport and Riverside include traffic on Memorial Drive and other local roads. While SFR and I-90 will be audible from various locations throughout Cambridgeport and Riverside, noise from these Project roads will be generally substantially lower than from traffic on other existing roads. There will be relatively minor differences in Design Year noise conditions among the Throat Area Variations.

Table 5.11-16: 2040 Noise Level Comparison for all Throat Area Variations: PDW Path, Magazine Beach, Cambridgeport & Riverside

Receptor Number	Location	Loudest-Hour Noise Level (Leq, dBA)			
		No-Build	3K-HV	3K-ABC	3K-AMP
PD-1	PDW Path	76.6	75.7	76.0	75.2
PD-2	PDW Path	78.8	76.8	78.1	77.7
PD-3	PDW Path	78.5	76.1	78.1	76.8
PD-4	PDW Path	78.4	75.8	77.1	77.2
PD-5	PDW Path	78.5	67.0	68.3	69.1
PD-6	PDW Path	77.2	64.7	65.7	64.1
PD-7	PDW Path	75.9	65.0	66.3	65.3
MB-1	Magazine Beach Trail	67.3	65.4	67.6	65.8
MB-2	Magazine Beach Trail	67.6	64.7	66.7	65.3
MB-3	Veteran’s Memorial Pool	63.8	61.2	62.7	61.3
MB-4	Soccer Field	65.0	63.3	64.8	62.9
MB-5	Magazine Beach Train	65.8	63.2	65.0	63.6
MB-6	Soccer Field Near Memorial Drive	66.0	64.2	64.5	63.7
CP-1	Morse Elementary School	65.7	63.6	63.5	63.1
CP-2	32 Rockingham Street	59.3	59.0	58.4	57.7
CP-3	47 Granite Street	60.2	58.6	57.4	56.4
CP-4	6 Gordon Place	57.9	56.0	54.8	54.2
CP-5	26 Glenwood Avenue	59.1	54.7	55.1	54.2
CP-6	23-25 Glenwood Avenue	58.1	52.4	52.3	51.5
RV-1	Riverside Press Park	66.3	65.5	65.7	64.4
RV-2	Riverside Press Playground	61.5	58.2	58.4	57.4
RV-3	808 Memorial Drive	67.5	66.9	66.6	66.4
RV-4	173 Pleasant Street	59.2	57.1	56.3	55.4

** Leq noise levels used to assess noise at FTA Category 3 land use*

Table 5.11-17: 2040 Noise Impact Assessment Results – PDW Path, Magazine Beach, Cambridgeport and Riverside – 3K-HV Variation

Receptor Number	Location	Design Year Build Loudest-Hour Noise Level (Leq, dBA)			MassDOT NAC Assessment	Day-Night Average Noise Level (Ldn, dBA)				FTA Noise Impact Assessment
		Road Sources	Train Sources	Total		Existing (2017)	FTA Impact Criteria		Design Year Build	
							Moderate	Severe		
PD-1	PDW Path	75.4	64.6	75.7	**Exceeds NAC**	76.5*	77.4	81.2	75.7*	No Impact
PD-2	PDW Path	76.1	68.7	76.8	**Exceeds NAC**	78.7*	79.2	82.4	76.8*	No Impact
PD-3	PDW Path	75.2	69.1	76.1	**Exceeds NAC**	78.9*	79.0	82.3	76.1*	No Impact
PD-4	PDW Path	74.8	68.7	75.8	**Exceeds NAC**	78.3*	78.8	82.2	75.8*	No Impact
PD-5	PDW Path	64.6	63.4	67.0	**Exceeds NAC**	78.4*	78.9	82.2	67.0*	No Impact
PD-6	PDW Path	63.6	58.2	64.7	Below NAC	77.4*	78.1	81.9	64.7*	No Impact
PD-7	PDW Path	64.5	55.0	65.0	Below NAC	76.2*	77.1	80.9	65.0*	No Impact
MB-1	Magazine Beach Trail	64.3	59.1	65.4	Below NAC	66.5*	69.8	73.3	65.4*	No Impact
MB-2	Magazine Beach Trail	63.4	58.7	64.7	Below NAC	67.0*	70.1	73.5	64.7*	No Impact
MB-3	Veteran's Memorial Pool	59.9	55.4	61.2	Below NAC	63.3*	67.0	70.9	61.2*	No Impact
MB-4	Soccer Field	62.0	57.4	63.3	Below NAC	64.5*	68.0	71.7	63.3*	No Impact
MB-5	Magazine Beach Train	61.9	57.4	63.2	Below NAC	65.2*	68.5	72.2	63.2*	No Impact
MB-6	Soccer Field Near Memorial Drive	63.5	56.2	64.2	Below NAC	65.8*	69.0	72.6	64.2*	No Impact
CP-1	Morse Elementary School	62.9	55.2	63.6	Below NAC	65.6*	68.9	72.5	63.6*	No Impact
CP-2	32 Rockingham Street	57.4	54.0	59.0	Below NAC	61.2	63.1	65.8	61.0	No Impact
CP-3	47 Granite Street	58.1	48.9	58.6	Below NAC	61.6	63.3	66.1	60.6	No Impact
CP-4	6 Gordon Place	55.3	47.9	56.0	Below NAC	59.4	61.5	64.6	58.0	No Impact
CP-5	26 Glenwood Avenue	53.9	46.9	54.7	Below NAC	60.5	62.5	65.4	56.7	No Impact
CP-6	23-25 Glenwood Avenue	51.5	45.0	52.4	Below NAC	59.5	61.5	64.6	54.3	No Impact
RV-1	Riverside Press Park	65.4	49.5	65.5	Below NAC	66.2*	69.4	73.0	65.5*	No Impact
RV-2	Riverside Press Playground	57.6	49.2	58.2	Below NAC	59.6*	64.3	68.8	58.2*	No Impact
RV-3	808 Memorial Drive	65.2	61.9	66.9	**Exceeds NAC**	69.4	70.5	72.2	68.8	No Impact
RV-4	173 Pleasant Street	56.7	46.5	57.1	Below NAC	60.9	62.7	65.6	59.1	No Impact

**Leq noise levels used to assess noise at FTA Category 3 land use*

As shown in Table 5.11-17 and Graphic 5.11-11, the loudest-hour Design Year noise levels for 3K-HV will be:

- 65 to 77 dBA (Leq) on the PDW Path,
- 61 to 65 dBA (Leq) in Magazine Beach,
- 52 to 64 dBA (Leq) in the Cambridgeport area, and
- 57 to 67 dBA (Leq) in the Riverside area.

Design Year noise levels will exceed the NAC on the PDW Path near the Throat Area, in a limited area of Magazine Beach towards the east, close to the Charles River, and at receptors in the Riverside area close to Memorial Drive. Table 5.11-17 shows existing and Design Year day-night average noise levels (Ldn) and the results of the FTA noise impact assessment. Design Year noise levels will decrease up to 1 decibel on the PDW Path through the Throat Area due to shifting SFR farther away, decrease 8 to 12 decibels on the PDW Path near the proposed underpass, and decrease 1 to 2 decibels throughout Magazine Beach, Cambridgeport and Riverside. Therefore, there will be no impact according to FTA impact criteria.

Since noise levels will exceed the NAC on the PDW Path, a limited area of Magazine Beach and at locations along Memorial Drive, it will be necessary to evaluate the engineering feasibility, acoustical and cost effectiveness of potential noise abatement for the 3K-HV Variation.

As shown in Table 5.11-18 and Graphic 5.11-12, the loudest-hour Design Year noise levels for 3K-ABC will be:

- 66 to 78 dBA (Leq) on the PDW Path,
- 63 to 68 dBA (Leq) in Magazine Beach,
- 52 to 64 dBA (Leq) in the Cambridgeport area, and
- 56 to 67 dBA (Leq) in the Riverside area.

Design Year noise levels will exceed the NAC on the PDW Path near the Throat Area, the receptors closest to the Charles River in Magazine Beach including the soccer field, and at receptors in the Riverside area close to Memorial Drive. The table shows existing and Design Year day-night average noise levels (Ldn) and the results of the FTA noise impact assessment. Design Year noise levels will not change substantially at receptors on the PDW Path through the Throat Area. There will be no impact according to FTA criteria. Other receptors on the PDW Path will decrease 9 to 11 decibels near the proposed underpass. Noise levels (Ldn) will generally be similar to existing conditions (within 1 decibel) throughout Magazine Beach. Design Year noise levels will decrease 1 to 2 decibels in the Cambridgeport and Riverside areas. Therefore, there will be no impact according to FTA impact criteria.

Since noise levels will exceed the NAC on the PDW Path, portions of Magazine Beach and at locations along Memorial Drive, it will be necessary to evaluate the engineering feasibility, acoustical and cost effectiveness of potential noise abatement for the 3K-ABC Variation.

Table 5.11-18: 2040 Noise Impact Assessment Results – PDW Path, Magazine Beach, Cambridgeport and Riverside– 3K-ABC Variation

Receptor Number	Location	Design Year Build Loudest-Hour Noise Level (Leq, dBA)			MassDOT NAC Assessment	Day-Night Average Noise Level (Ldn, dBA)				FTA Noise Impact Assessment
		Road Sources	Train Sources	Total		Existing (2017)	FTA Impact Criteria		Design Year Build	
							Moderate	Severe		
PD-1	PDW Path	75.7	64.6	76.0	**Exceeds NAC**	76.5*	77.4	81.2	76.0*	No Impact
PD-2	PDW Path	77.6	68.5	78.1	**Exceeds NAC**	78.7*	79.2	82.4	78.1*	No Impact
PD-3	PDW Path	77.6	68.5	78.1	**Exceeds NAC**	78.5*	79.0	82.3	78.1*	No Impact
PD-4	PDW Path	76.6	67.7	77.1	**Exceeds NAC**	78.3*	78.8	82.2	77.1*	No Impact
PD-5	PDW Path	66.9	62.7	68.3	**Exceeds NAC**	78.4*	78.9	82.2	68.3*	No Impact
PD-6	PDW Path	64.9	58.0	65.7	**Exceeds NAC**	77.4*	78.1	81.9	65.7*	No Impact
PD-7	PDW Path	66.0	54.9	66.3	**Exceeds NAC**	76.2*	77.1	80.9	66.3*	No Impact
MB-1	Magazine Beach Trail	66.9	59.0	67.6	**Exceeds NAC**	66.6*	69.8	73.3	67.6*	No Impact
MB-2	Magazine Beach Trail	66.0	58.5	66.7	**Exceeds NAC**	67.0*	70.1	73.5	66.7*	No Impact
MB-3	Veteran's Memorial Pool	61.9	55.2	62.7	Below NAC	63.3*	67.0	70.9	62.7*	No Impact
MB-4	Soccer Field	63.9	57.3	64.8	Below NAC	64.5*	68.0	71.7	64.8*	No Impact
MB-5	Magazine Beach Train	64.2	57.2	65.0	Below NAC	65.2*	68.5	72.2	65.0*	No Impact
MB-6	Soccer Field Near Memorial Drive	63.8	56.1	64.5	Below NAC	65.8*	69.0	72.6	64.5*	No Impact
CP-1	Morse Elementary School	62.8	55.1	63.5	Below NAC	62.6*	66.5	70.5	61.4*	No Impact
CP-2	32 Rockingham Street	56.5	54.0	58.4	Below NAC	61.2	63.0	65.8	60.5	No Impact
CP-3	47 Granite Street	57.0	48.9	57.4	Below NAC	61.6	63.3	66.1	59.3	No Impact
CP-4	6 Gordon Place	53.8	47.9	54.8	Below NAC	59.4	61.5	64.8	56.7	No Impact
CP-5	26 Glenwood Avenue	54.4	46.9	55.1	Below NAC	60.5	62.5	65.4	57.1	No Impact
CP-6	23-25 Glenwood Avenue	51.4	44.9	52.3	Below NAC	59.5	61.5	64.6	54.3	No Impact
RV-1	Riverside Press Park	65.6	49.5	61.3	Below NAC	62.0*	66.1	70.2	61.3*	No Impact
RV-2	Riverside Press Playground	57.8	49.1	58.4	Below NAC	59.6*	64.3	68.8	58.4*	No Impact
RV-3	808 Memorial Drive	64.9	61.8	66.6	**Exceeds NAC**	69.4	70.5	72.2	68.6	No Impact
RV-4	173 Pleasant Street	55.8	46.4	56.3	Below NAC	60.9	62.7	65.6	58.3	No Impact

**Leq noise levels used to assess noise at FTA Category 3 land use*

Table 5.11-19: 2040 Noise Impact Assessment Results – PDW Path, Magazine Beach, Cambridgeport and Riverside– 3K-AMP Variation

Receptor Number	Location	Design Year Build Loudest-Hour Noise Level (Leq, dBA)			MassDOT NAC Assessment	Day-Night Average Noise Level (Ldn, dBA)				FTA Noise Impact Assessment
		Road Sources	Train Sources	Total		Existing (2017)	FTA Impact Criteria		Design Year Build	
							Moderate	Severe		
PD-1	PDW Path	74.8	64.7	75.2	**Exceeds NAC**	76.5*	77.4	81.2	75.2*	No Impact
PD-2	PDW Path	77.1	68.8	77.7	**Exceeds NAC**	78.7*	79.2	82.4	77.7*	No Impact
PD-3	PDW Path	76.0	68.9	76.8	**Exceeds NAC**	78.5*	79.0	82.3	76.8*	No Impact
PD-4	PDW Path	76.6	68.1	77.2	**Exceeds NAC**	78.3*	78.8	82.2	77.2*	No Impact
PD-5	PDW Path	67.9	62.9	69.1	**Exceeds NAC**	78.4*	78.9	82.2	69.1*	No Impact
PD-6	PDW Path	62.9	58.1	64.1	Below NAC	77.4*	78.1	81.9	64.1*	No Impact
PD-7	PDW Path	64.9	55.0	65.3	Below NAC	76.2*	77.1	80.9	65.3*	No Impact
MB-1	Magazine Beach Trail	64.8	59.1	65.8	**Exceeds NAC**	66.6*	69.8	73.3	65.8*	No Impact
MB-2	Magazine Beach Trail	64.3	58.6	65.3	Below NAC	67.0*	70.1	73.5	65.3*	No Impact
MB-3	Veteran's Memorial Pool	60.0	55.3	61.3	Below NAC	63.3*	67.0	70.9	61.3*	No Impact
MB-4	Soccer Field	61.5	57.4	62.9	Below NAC	64.5*	68.0	71.7	62.9*	No Impact
MB-5	Magazine Beach Train	62.4	57.3	63.6	Below NAC	65.2*	68.5	72.2	63.6*	No Impact
MB-6	Soccer Field Near Memorial Drive	62.8	56.2	63.7	Below NAC	65.8*	69.0	72.6	63.7*	No Impact
CP-1	Morse Elementary School	62.3	55.2	63.1	Below NAC	65.6*	68.9	72.5	63.1*	No Impact
CP-2	32 Rockingham Street	55.3	54.0	57.7	Below NAC	61.2	63.0	65.8	59.8	No Impact
CP-3	47 Granite Street	55.5	48.9	56.4	Below NAC	61.6	63.3	66.1	58.3	No Impact
CP-4	6 Gordon Place	54.0	47.9	54.2	Below NAC	59.4	61.5	64.6	56.1	No Impact
CP-5	26 Glenwood Avenue	53.3	46.9	54.2	Below NAC	60.5	62.5	65.4	56.2	No Impact
CP-6	23-25 Glenwood Avenue	50.4	45.0	51.5	Below NAC	59.5	61.5	64.6	53.5	No Impact
RV-1	Riverside Press Park	64.3	49.5	64.4	Below NAC	66.2*	69.4	73.0	64.4*	No Impact
RV-2	Riverside Press Playground	56.7	49.1	57.4	Below NAC	59.6*	64.3	68.8	57.4*	No Impact
RV-3	808 Memorial Drive	64.5	61.9	66.4	**Exceeds NAC**	69.4	70.5	72.2	68.3	No Impact
RV-4	173 Pleasant Street	54.8	46.5	55.4	Below NAC	60.9	62.7	65.6	57.4	No Impact

**Leq noise levels used to assess noise at FTA Category 3 land use*

As shown in Table 5.11-19 and Graphic 5.11-13, the loudest-hour Design Year noise levels for 3K-AMP will be:

- 64 to 78 dBA (Leq) on the PDW Path,
- 61 to 66 dBA (Leq) in Magazine Beach,
- 52 to 63 dBA (Leq) in the Cambridgeport area, and
- 55 to 67 dBA (Leq) in the Riverside area.

Similar to the 3K-ABC and 3K-HV Variations, noise levels will exceed the NAC on the PDW Path near the Throat Area. Receptors closest to the Charles River on the Magazine Beach Trail and receptors in the Riverside area close to Memorial Drive will also exceed the NAC. The table shows existing and Design Year day-night average noise levels (Ldn) and the results of the FTA noise impact assessment. Similar to the 3K-ABC Variation, Design Year noise levels will decrease about 1 dBA (Ldn) at receptors on the PDW Path through the Throat Area. Other receptors on the PDW Path will decrease 7 to 13 decibels near the proposed underpass. Noise levels (Ldn) will decrease approximately 1 to 3 decibels compared to existing conditions throughout the Cambridgeport, Magazine Beach and Riverside areas.

Since noise levels will exceed the NAC on the PDW Path, portions of Magazine Beach and at locations on Memorial Drive, it will be necessary to evaluate the engineering feasibility, acoustical and cost effectiveness of potential noise abatement for the 3K-AMP Variation.

Noise Abatement Evaluation at Riverside for All Variations

Since noise levels will exceed the NAC at locations near Memorial Drive in Riverside for all Throat Area Variations, abatement must be considered. The predominant noise source at receptors exceeding the NAC is traffic on Memorial Drive, which is not a result of the Project. Receptors exceeding the NAC include a high-rise residential building with outdoor balconies. It will not be feasible from an engineering standpoint to attenuate sound to receptors at ground-level or on elevated balconies due to the need to provide access to Memorial Drive. Therefore, a noise barrier will not be feasible or reasonable in Riverside.

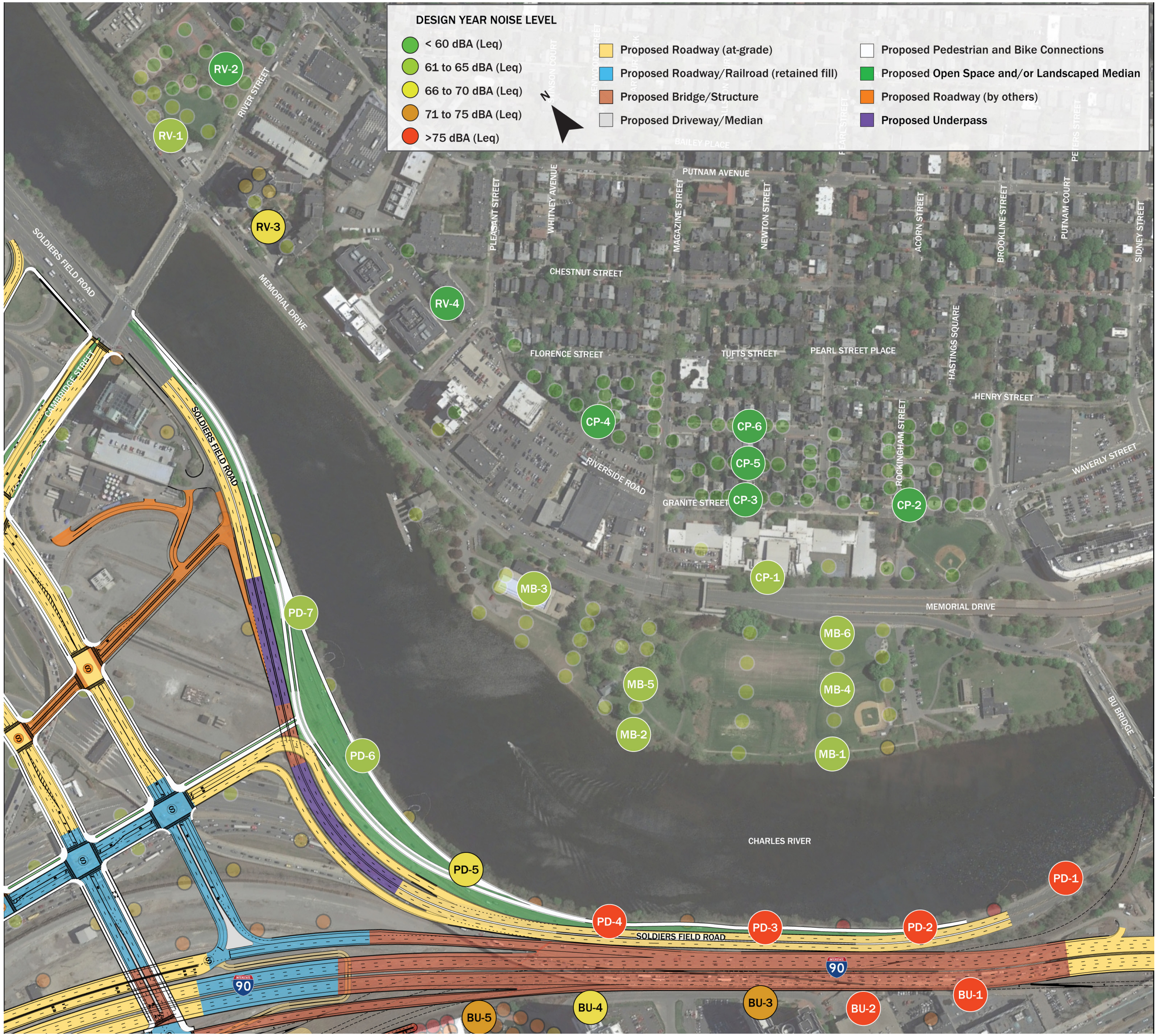
Noise Abatement Evaluation at PDW Path for 3K-HV Variation

Noise abatement for receptors on the PDW Path and Magazine Beach were evaluated including a noise wall that will be constructed along the north side of SFR and a noise wall on the edge of the I-90 viaduct as an extension of the proposed 3.5-foot parapet wall. Two noise walls will be necessary to effectively reduce overall noise levels.

A noise wall along the north side of SFR will not be feasible from an engineering standpoint. Specifically, the barrier will most likely not be able to be setback sufficiently far from the roadway for safety and maintenance. Additionally, a noise wall in this location will result in a potentially unsafe corridor for pedestrians and bicyclists based on the inability to egress from the PDW Path with the Charles River on one side and a noise wall on the other. Irrespective of these safety and maintenance concerns, an acoustical and cost effectiveness analysis was conducted to further understand the potential feasibility and reasonableness of noise walls.

For the 3K-HV Variation, combinations of noise walls ranging in height between 8 and 20 feet on the I-90 viaduct and between 8 and 20 feet along SFR were evaluated. The evaluation showed that the lowest CEI will be achieved with an 8-foot extension to the 3.5-foot parapet wall on I-90 and an 8-foot noise wall on the north side of SFR that will provide an average of 7 decibels of noise reduction and a maximum of 9 decibels. Noise reduction at receptors on Magazine Beach will typically be 1 decibel or less. The noise walls will need to extend approximately 2,000 feet each to benefit the impacted receptors at PD-1 through PD-5.

For Activity Category C land use, such as PDW Path, the CEI of noise walls depends on the amount of human use that typically occurs at the land use. A previous study conducted by the FHWA, *Evaluation of Safety, Design and Operation of Shared-Use Paths* (dated May, 2005), includes detailed counts and travel speeds of pedestrians, bicyclists, runners and in-line skaters that use the PDW Path. Additional use data for the PDW Path was collected in 2007 by the Boston MPO. These studies show that up to 434 people use the PDW Path during peak hours of use including 73% bicyclists, 8% pedestrians, 15% in-line skaters and 4% runners. The average speeds of these different modes of path use are 4 to 12 mph. Since the PDW Path is a linear trail, the amount of human use is based on the volume of people and their average speed. Consequently, the total number of person-hours of use is relatively low for linear trails since the amount of time any one individual is on the trail is only a few minutes depending on travel speed. For the 2000-foot barrier segment analyzed, the total number of person-hours of use is 16.


DESIGN YEAR NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
66 to 70 dBA (Leq)
71 to 75 dBA (Leq)
>75 dBA (Leq)
Proposed Roadway (at-grade)
Proposed Roadway/Railroad (retained fill)
Proposed Bridge/Structure
Proposed Driveway/Median
Proposed Pedestrian and Bike Connections
Proposed Open Space and/or Landscaped Median
Proposed Roadway (by others)
Proposed Underpass
N
RV-1
RV-2
RV-3
RV-4
CP-1
CP-2
CP-3
CP-4
CP-5
CP-6
MB-1
MB-2
MB-3
MB-4
MB-5
MB-6
PD-1
PD-2
PD-3
PD-4
PD-5
PD-6
PD-7
BU-1
BU-2
BU-3
BU-4
BU-5
RIVER STREET
MEMORIAL DRIVE
SOLDIERS FIELD ROAD
CAMBRIDGE STREET
PUTNAM AVENUE
PLEASANT STREET
WHITNEY AVENUE
MAGAZINE STREET
NEWTON STREET
ACORN STREET
BROOKLINE STREET
PUTNAM COURT
SIDNEY STREET
CHESTNUT STREET
FLORENCE STREET
TUFTS STREET
PEARL STREET PLACE
HASTINGS SQUARE
HENRY STREET
ROCKINGHAM STREET
WAVERLY STREET
RIVERSIDE ROAD
GRANITE STREET
CHARLES RIVER
BU BRIDGE
90

Graphic 5.11-11: Design Year Noise Levels at PDW Path, Magazine Beach, Cambridgeport and Riverside – 3K-HV Variation

Table 5.11-20 summarizes the acoustical and cost effectiveness analysis of potential noise walls to benefit impacted receptors on the PDW Path for the 3K-HV Variation. This table shows that two 8-foot-tall, 2,000-foot-long noise walls will cost $1,600,000, provide an average of 6.9 decibels of noise reduction and a maximum of 9.2 decibels of reduction. The total number of benefited person-hours will be 16 and the resulting CEI for Activity Category C land use will be $14,500. This is substantially higher than the $138 criterion for Activity Category C land use. Therefore, the noise walls will not be considered feasible and reasonable.

Table 5.11-20: Noise Wall Evaluation Summary for PDW Path 3K-HV Variation

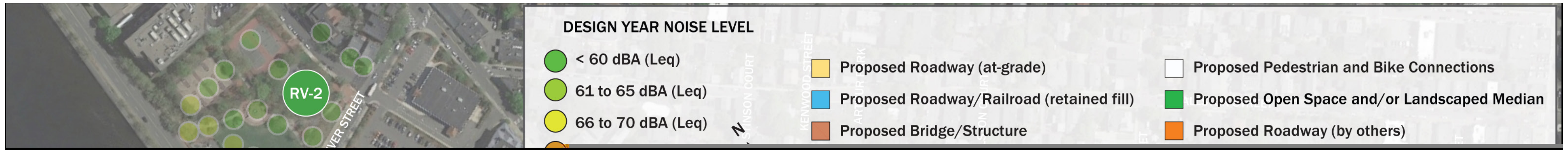
Description	Result
Noise Wall Length (ft)	2 x 2000
Noise Wall Height (ft)	8 (at-grade); 8 (viaduct)
Noise Wall Cost ($50/SF)	$1,600,000
Number of Benefited Persons-Hours	16
Average Noise Reduction (dBA)	6.9
Maximum Noise Reduction (dBA)	9.2
Category C Cost Effectiveness Index Criterion	$138
Feasible and Reasonable	No

Source: MassDOT, 2017

Noise Abatement Evaluation at PDW Path and Magazine Beach for 3K-ABC Variation

Noise abatement for receptors on the PDW Path and Magazine Beach for the 3K-ABC Variation were evaluated, including a noise wall that will be constructed along the north side of SFR. As previously discussed, a noise wall along the north side of SFR will not be feasible from an engineering standpoint due to safety and maintenance considerations. Irrespective of these safety and maintenance concerns, an acoustical and cost effectiveness analysis was conducted to further understand the potential feasibility and reasonableness of a potential noise wall for the 3K-ABC Variation.

For the 3K-ABC Variation, noise walls ranging in height between 8 and 20 feet on the north side of SFR were evaluated. The evaluation showed that an 8-foot noise wall, 2000-feet-long will provide an average of 9 decibels of noise reduction to the PDW Path, but will not benefit impacted receptors at Magazine Beach. A 12-foot noise wall will provide an average of 9.7 decibels of noise reduction on the PDW Path and an average of 5.5 decibels of noise reduction in the closest parts of Magazine Beach, but not including the Memorial Pool. A 16-foot noise wall will provide an average of 10.5 decibels of noise reduction on the PDW Path and will benefit receptors in Magazine Beach including the Memorial Pool. The noise wall will need to extend approximately 4,500 feet long to benefit the impacted receptors at PD-1 through PD-7 and at Magazine Beach.


RV-2
VER STREET
DESIGN YEAR NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
66 to 70 dBA (Leq)
Proposed Roadway (at-grade)
Proposed Roadway/Railroad (retained fill)
Proposed Bridge/Structure
Proposed Pedestrian and Bike Connections
Proposed Open Space and/or Landscaped Median
Proposed Roadway (by others)
N

Graphic 5.11-12: Design Year Noise Levels at PDW Path, Magazine Beach, Cambridgeport and Riverside – 3K-ABC Variation

Both the PDW Path and Magazine Beach are Activity Category C land use, so the CEI depends on the amount of human use that typically occurs. As described for the 3K-HV Variation, use of the PDW Path depends on the number of people, their modes of travel and the time they would be on the path. For the 4,500-foot segment of potential noise barrier, the total number of person-hours of use is 36. Uses at Magazine Beach include the Memorial Pool, multi-purpose fields, baseball diamond and general trails. The most substantial use is associated with the Memorial Pool. A study conducted by DCR indicates that up to 200 people use the pool on a good weather day, and use of the baseball diamond and multi-purpose fields can be up to 100 people.

Table 5.11-21 summarizes the acoustical and cost effectiveness analysis of a potential noise wall to benefit the PDW Path and Magazine Beach for the 3K-ABC Variation. This table shows that the lowest CEI would be achieved with a 12-foot-tall and 4,500-foot-long noise wall that will cost $2,700,000, provide an average of 9.7 decibels of noise reduction and a maximum of 13 decibels of reduction. The total number of benefited person-hours will be 136 based on benefiting 4500 feet of the PDW Path, the baseball diamond and the multi-purpose fields at Magazine Beach. The resulting CEI will be $2,050. The CEI is substantially higher than the $138 criterion for Activity Category C land use. Even if taller noise wall designs were to benefit the Memorial Pool, the CEI would still be substantially greater than the criterion. Therefore, the noise walls will not be considered feasible and reasonable based on engineering feasibility and cost effectiveness criteria.

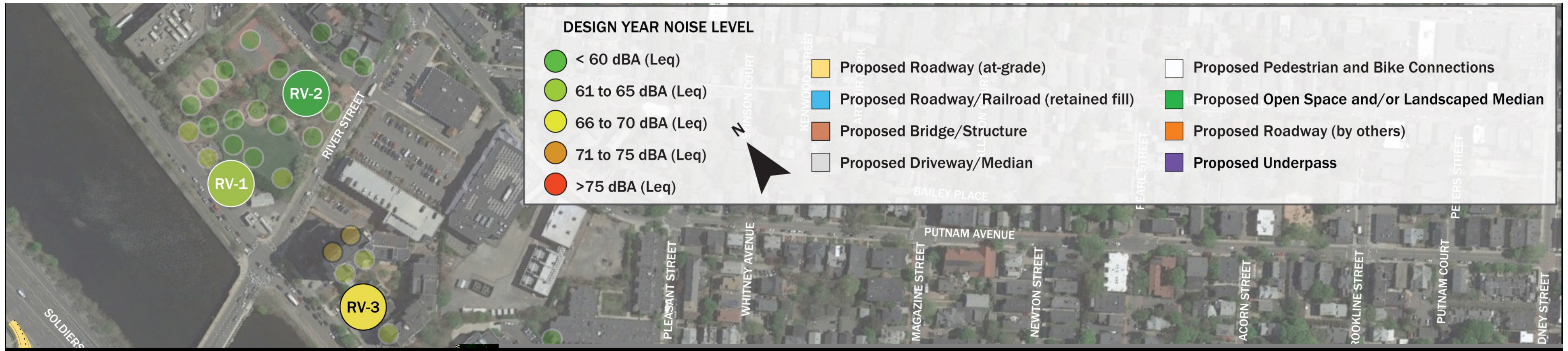
Table 5.11-21: Noise Wall Evaluation Summary for PDW Path and Magazine Beach – 3K-ABC Variation

Description	Result
Noise Wall Length (ft)	4500
Noise Wall Height (ft)	12
Noise Wall Cost ($50/SF)	$2,700,000
Number of Benefited Persons-Hours	136
Average Noise Reduction (dBA)	9.7
Maximum Noise Reduction (dBA)	13
Cost Effectiveness Index ($/dBIL/person/hour)	$2,050
Category C Cost Effectiveness Index Criterion	$138
Feasible and Reasonable	No

Source: MassDOT, 2017

Noise Abatement Evaluation at PDW Path and Magazine Beach for 3K-AMP Variation

Noise abatement for receptors on the PDW Path and Magazine Beach were evaluated including a noise wall that will be constructed along the north side of SFR. As previously discussed, a noise wall along the north side of SFR will not be feasible from an engineering standpoint due to safety and maintenance considerations. Irrespective of these safety and maintenance concerns, an acoustical and cost effectiveness analysis was conducted to further understand the potential feasibility and reasonableness of a potential noise wall for the 3K-AMP Variation.


DESIGN YEAR NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
66 to 70 dBA (Leq)
71 to 75 dBA (Leq)
>75 dBA (Leq)
Proposed Roadway (at-grade)
Proposed Roadway/Railroad (retained fill)
Proposed Bridge/Structure
Proposed Driveway/Median
Proposed Pedestrian and Bike Connections
Proposed Open Space and/or Landscaped Median
Proposed Roadway (by others)
Proposed Underpass
N
RV-1
RV-2
RV-3
RIVER STREET
PUTNAM AVENUE
PLEASANT STREET
WHITNEY AVENUE
MAGAZINE STREET
NEWTON STREET
ACORN STREET
PUTNAM COURT
BAILEY PLACE

Graphic 5.11-13: Design Year Noise Levels at PDW Path, Magazine Beach, Cambridgeport and Riverside – 3K-AMP Variation

For the 3K-AMP Variation, noise walls ranging in height between 8 and 20 feet on the north side of SFR were evaluated. The evaluation showed that an 8-foot noise wall will provide an average of 6.7 decibels of noise reduction to the PDW Path, but will not benefit impacted receptors at Magazine Beach. Either a 12-foot or 16-foot noise wall will provide an average of 10 decibels of noise reduction to benefited receptors on the PDW Path, but will not benefit impacted receptors at Magazine Beach. The noise wall will need to extend approximately 4,500 feet long to benefit the impacted receptors at PD-1 through PD-7 and at Magazine Beach. A 20-foot-tall and 4,500-foot-long noise wall will benefit impacted receptors on both the PDW Path and Magazine Beach including the baseball diamond and multi-purpose fields.

Table 5.11-22 summarizes the acoustical and cost effectiveness analysis of a potential noise wall to benefit the PDW Path and Magazine Beach for the 3K-AMP Variation. This table shows that the lowest CEI would be achieved with a 20-foot-tall and 4,500-foot-long noise wall that will cost $4,500,000, provide an average of 9 decibels of noise reduction to benefited receptors and a maximum of 15 decibels of reduction. The total number of benefited person-hours will be 136 based on benefiting 4,500 feet of the PDW Path, the baseball diamond and the multi-purpose fields at Magazine Beach. The resulting CEI will be $3,400. The CEI is substantially higher than the $138 criterion for Activity Category C land use. Even if taller noise wall designs were to benefit the Memorial Pool, the CEI will still be substantially greater than the criterion. Therefore, the noise wall will not be considered feasible and reasonable based on engineering feasibility and cost effectiveness.

Table 5.11-22: Noise Wall Evaluation Summary for PDW Path and Magazine Beach – 3K-AMP Variation

Description	Result
Noise Wall Length (ft)	4500
Noise Wall Height (ft)	20
Noise Wall Cost ($50/SF)	$4,500,000
Number of Benefited Persons-Hours	136
Average Noise Reduction (dBA)	9.0
Maximum Noise Reduction (dBA)	15
Category C Cost Effectiveness Index Criterion	$138
Feasible and Reasonable	No

Source: MassDOT, 2017

5.11.5.4 Cambridge Street

All three Throat Area Variations will have a similar effect on future noise conditions in the Cambridge Street area. The Project will introduce a new roadway network for the Innovation Area in Allston Landing South, and it will reconfigure travel and turning lanes on Cambridge Street. Traffic volumes, speeds and the percentage of trucks using Cambridge Street will decrease in the Design Year due to the overall transportation improvements associated with the Project. Therefore, Design Year noise levels will actually decrease relative to existing conditions.

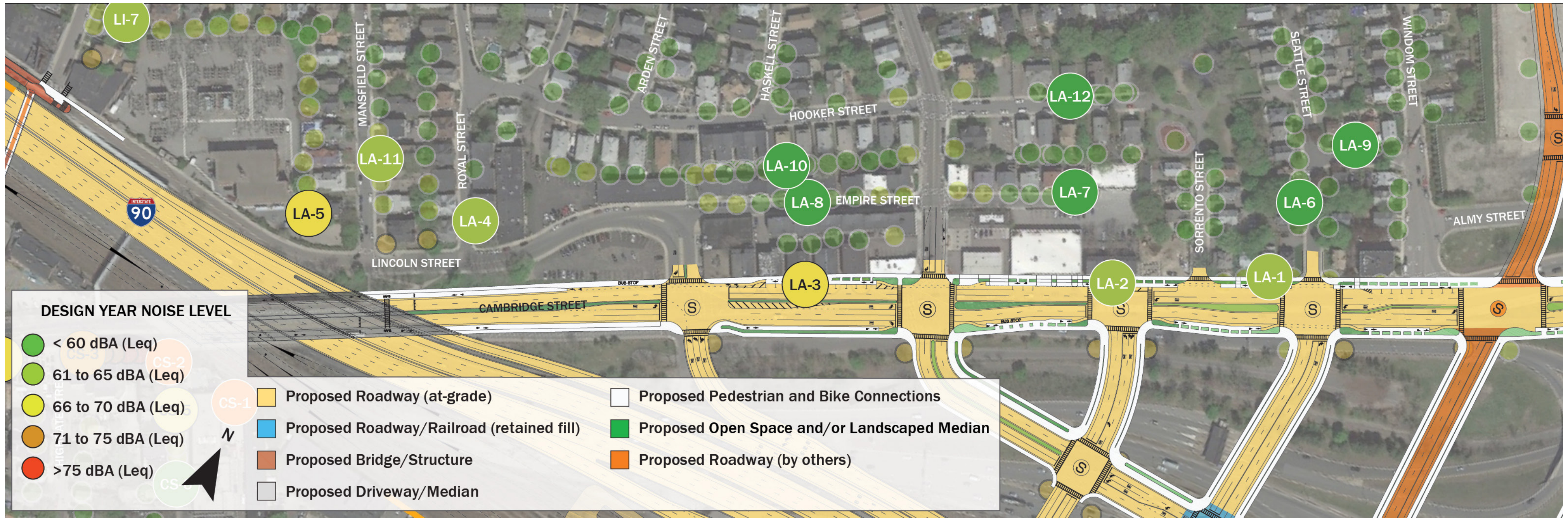
The predominant noise source in this area will be derived from traffic on local roads, including Cambridge Street. Currently, highway noise from I-90 is audible, but substantially lower than noise generated from local traffic. The contribution of noise from I-90 will be reduced with the realignment of I-90 farther away from this area. Train operations contribute substantially less noise than I-90 to the overall noise environment.

Table 5.11-23: Noise Impact Assessment Results - Cambridge Street – All Variations

Receptor Number	Location	Design Year Build Loudest-Hour Noise Level (Leq, dBA)			MassDOT NAC Assessment	Day-Night Average Noise Level (Ldn, dBA)				FTA Noise Impact Assessment
		Road Sources	Train Sources	Total		Existing (2017)	FTA Impact Criteria		Design Year Build	
							Moderate	Severe		
LA-1	171 Cambridge Street	62.5	55.7	63.3	Below NAC	72.4	73.0	74.8	65.3	No Impact
LA-2	193 Cambridge Street	63.9	56.3	64.6	Below NAC	74.5	74.9	76.7	66.6	No Impact
LA-3	245-247 Cambridge Street	66.0	58.7	66.7	**Exceeds NAC**	76.9	77.1	78.9	68.7	No Impact
LA-4	11-15 Royal Street	62.6	61.7	65.2	Below NAC	69.0	70.0	71.8	67.1	No Impact
LA-5	10 Mansfield Street	65.8	64.6	68.3	**Exceeds NAC**	70.7	71.6	73.3	70.2	No Impact
LA-6	12 Seattle Street	55.3	48.5	56.1	Below NAC	64.1	65.6	68.0	58.1	No Impact
LA-7	100-102 Empire Street	56.5	50.7	57.5	Below NAC	66.2	67.5	69.6	59.5	No Impact
LA-8	64 Empire Street	58.7	51.1	59.4	Below NAC	66.2	67.5	69.6	61.4	No Impact
LA-9	5 Amboy Street	54.7	44.8	55.1	Below NAC	62.6	64.2	66.8	57.1	No Impact
LA-10	51-53 Hooker Street	51.7	49.3	53.7	Below NAC	58.3	60.7	64.0	55.6	No Impact
LA-11	15 Mansfield Street	60.0	55.2	61.3	Below NAC	64.9	66.2	68.5	63.2	No Impact
LA-12	102-104 Hooker Street	53.0	46.9	53.9	Below NAC	61.1	62.9	65.7	55.9	No Impact

**Leq noise levels used to assess noise at FTA Category 3 land use*

As shown in Table 5.11-23 and Graphic 5.11-14, the loudest-hour Design Year noise levels will be 54 to 61 dBA (Leq) at first-row receptors such as LA-1 to LA-5. Noise levels at receptors LA-3 and LA-5 will exceed the NAC. Noise levels at second-row receptors will generally be 55 to 61 dBA (Leq) and will be below the NAC. The FTA noise assessment shows that Design Year noise levels will generally be up to 5 decibels quieter than existing conditions due primarily to the decrease in traffic volumes, speeds and truck percentages on Cambridge Street. Therefore, the Project will cause no impact according to FTA impact criteria.



Graphic 5.11-14: Design Year Noise Levels at Cambridge Street

Noise Abatement Evaluation in Cambridge Street Area

While the future noise levels in this area will decrease in the Design Year, noise levels at some of the first-row receptors will still exceed the NAC, and the Project must evaluate noise abatement such as traffic management measures, traffic control devices, vehicle-type restrictions, nighttime-use restrictions, reducing speeds, designated lanes, alteration of the horizontal or vertical alignment, and construction of noise barriers. Noise barriers will not be feasible on Cambridge Street due to access conflicts (i.e., driveways/curbcuts). The proposed design of Cambridge Street already includes elements to help improve the noise environment, such as locating bus stops away from receptors, slowing traffic speeds, and shifting travel lanes away from receptors by providing wider sidewalks for pedestrian and bike access. Therefore, additional noise abatement measures are not warranted.

Since noise levels at receptors near Lincoln Street and Mansfield Street, such as LA-5, exceed the NAC, the engineering feasibility, acoustical and cost effectiveness of a potential noise wall was evaluated. There is an existing staircase for pedestrian access between Lincoln Street and Cambridge Street that will conflict with a potential wall along Cambridge Street. A wall along I-90 extending from approximately the Cambridge Street bridge abutment to the west will likely be feasible considering engineering and safety factors. An evaluation of the acoustical effectiveness of this potential noise wall indicates that less than 3 decibels of noise reduction will be achieved. Such a barrier will not be acoustically effective. Therefore, noise abatement will not be feasible or reasonable in the Cambridge Street area.

5.11.5.5 Lincoln Street (Type II Noise Walls)

West of the physical limits of the Project, two potential Type II noise walls were evaluated: one on the westbound side (north side) of I-90 between Franklin Street and Everett Street, and one on the westbound side between Everett Street and Market Street. These noise walls, which have been on the MassDOT Type II priority list since 1992, were included in the noise study to evaluate the feasibility and reasonableness of abatement. They were also included in the study because they are adjacent to the western Project terminus. The Project may facilitate the construction of these Type II barriers if they are still found to be feasible and reasonable.

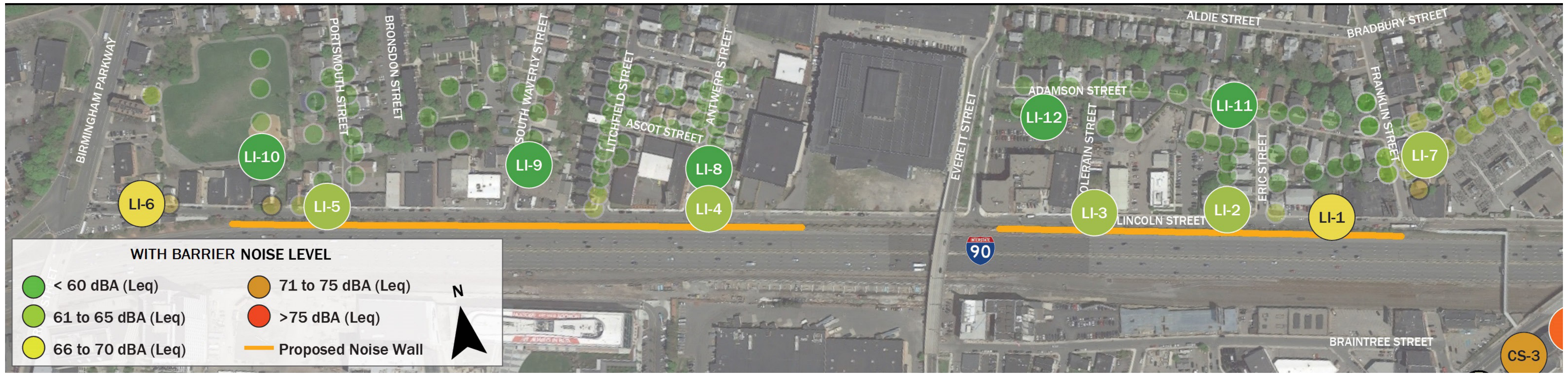
According to MassDOT noise policy, the evaluation of Type II noise walls is based on existing traffic conditions unlike the noise assessment for the proposed Type I project, which is based on future Design Year traffic conditions. The existing noise levels in this area range from 71 to 74 dBA (Leq) at most first-row receptors. These noise levels exceed NAC, so potential Type II barriers will be justified. Noise walls ranging in height between 12 and 24 feet were evaluated to determine their acoustical and cost effectiveness, and to identify a preliminary noise barrier design including height and location.

Table 5.11-24 presents noise levels without noise walls and with a 20-foot-tall and 1,200-foot-long wall between Cambridge Street and Everett Street, and an 18-foot-tall and 1,700-foot-long wall between Everett Street and Market Street. Noise levels with the proposed noise walls are shown in Graphic 5.11-15.

Table 5.11-24: Noise Levels Modeled with and without Abatement Type II Noise Wall Areas on Lincoln Street

Receptor Number	Location	Design Year Build Loudest-Hour Noise Level (Leq, dBA)		
		Without Noise Wall	With Noise Walls	Noise Reduction
LI-1	290-292 Lincoln Street	74.0	66.3	7.7
LI-2	2 Eric Road	72.6	63.5	9.1
LI-3	213 Lincoln Street	72.9	65.4	7.5
LI-4	142-144 Lincoln Street	72.7	64.4	8.3
LI-5	54-56 Lincoln Street	74.1	64.2	9.9
LI-6	14 Lincoln Street	71.1	70.5	0.6
LI-7	20-22 Alcott Street	63.0	63.0	0.0
LI-8	57 Antwerp Street	64.7	59.2	5.5
LI-9	5 S Waverly Street	56.4	51.6	4.8
LI-10	Portsmouth Playground	58.7	56.7	2.0
LI-11	56-58 Adamson Road	56.5	52.8	3.7
LI-12	3 Adamson Street	56.9	55.9	1.0

Source: MassDOT, 2017



Graphic 5.11-15: Noise Levels with Proposed Type II Noise Barriers at Lincoln Street

Table 5.11-25 summarizes the acoustical and cost effectiveness of the proposed noise wall between Cambridge Street and Everett Street. This barrier will benefit 58 dwelling units (provide 5 decibels or more of noise reduction), cost approximately $1,200,000 (based on $50 per square foot), and provide an average of 7.1 decibels of noise reduction to benefited receptors. The maximum noise reduction will be 9.6 decibels. The noise wall CEI for Activity Category B land use will be $2,920, which is well below the MassDOT criterion of $8,400. Therefore, this noise barrier will be considered feasible and reasonable according to MassDOT noise policy. It will be considered likely to be constructed.

Table 5.11-25: Proposed Type II Noise Wall – Cambridge Street to Everett Street

Description	Result
Noise Wall Length (ft)	1,200
Noise Wall Height (ft)	20
Noise Wall Cost ($50/SF)	$1,200,000
Number of Impacted Receptors in Barrier Area	20
Number of Benefited Receptors (Dwelling Units)	58
Average Noise Reduction (dBA)	7.1
Maximum Noise Reduction (dBA)	9.6
Cost Effectiveness Index ($/dBIL/Benefits)	$2,920
Feasible and Reasonable	Yes

Source: MassDOT, 2017

Table 5.11-26 summarizes the acoustical and cost effectiveness of the proposed noise wall between Everett Street and Market Street. This barrier will benefit 82 dwelling units (provide 5 decibels or more of noise reduction), cost approximately $1,530,000 (based on $50 per square foot), and provide an average of 6.8 decibels of noise reduction to benefited receptors. The maximum noise reduction will be 9.9 decibels. The noise wall CEI will be $2,750, which is well below the MassDOT criterion of $8,400. Therefore, this noise barrier will be considered feasible and reasonable according to MassDOT noise policy. It will be considered likely to be constructed.

As part of the process to determine the reasonableness of the wall, the viewpoints of benefited receptors will be solicited to determine their interests in constructing the noise walls.

5.11.5.6 Innovation Area

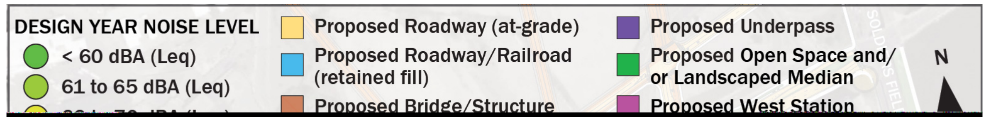
The Project will introduce new mixed-use developments in the Allston Landing South area called the Innovation Area. As described in the Noise section of Chapter 4, noise-sensitive receptors were only assessed for potential impact. They will only be eligible for noise abatement if they were permitted prior to the approval date of the environmental documentation. Future Design Year loudest-hour noise levels were evaluated at representative locations in this area for informational purposes only. Buildings were included within each buildable lot to include the acoustical shielding anticipated within the Innovation Area.

As shown in Table 5.11-27 and Graphic 5.11-16, Design Year noise levels will generally range between 62 and 72 dBA (Leq) at receptors located at typical property setbacks from the proposed roadways. These noise levels will be typical of urban areas. It will be a reasonable assumption to expect that building developers will design their buildings to be compatible with the noise environment and provide acceptable exterior and interior noise conditions.

Table 5.11-26: Proposed Type II Noise Wall – Everett Street to Market Street

Description	Result
Noise Wall Length (ft)	1,700
Noise Wall Height (ft)	18
Noise Wall Cost ($50/SF)	$1,530,000
Number of Impacted Receptors in Barrier Area	32
Number of Benefited Receptors (Dwelling Units)	82
Average Noise Reduction (dBA)	6.8
Maximum Noise Reduction (dBA)	9.9
Cost Effectiveness Index ($/dBIL/Benefits)	$2,750
Feasible and Reasonable	Yes

Source: MassDOT, 2017


DESIGN YEAR NOISE LEVEL
< 60 dBA (Leq)
61 to 65 dBA (Leq)
Proposed Roadway (at-grade)
Proposed Roadway/Railroad (retained fill)
Proposed Bridge/Structure
Proposed Underpass
Proposed Open Space and/ or Landscaped Median
Proposed West Station
N

[redacted]

Graphic 5.11-16: Design Year Noise Level in the Innovation Area

Table 5.11-27: Design Year Noise Levels in Innovation Area: All Variations

Receptor Number	Location	Design Year Build Loudest-Hour Noise Level (Leq, dBA)
IV-1	**Cambridge Street** between Lincoln Street and Cambridge Street South	65
IV-2	**Cambridge Street South** between Cambridge Street and West Connector	62
IV-3	**West Connector** between Cambridge Street and Cambridge Street South	63
IV-4	**Lincoln Street Connector** between Seattle Street and West Connector	72
IV-5	**Cambridge Street South** between Stadium Way and Seattle Street	63
IV-6	**Cambridge Street** between Stadium Way and Cattle Drive	63
IV-7	**Cattle Drive** between I-90 and Cambridge Street South	67
IV-8	**East Drive** between Cambridge Street South and Cambridge Street	62
IV-9	**I-90 Westbound Off-ramp** between I-90 and East Drive	72

Source: MassDOT, 2017

5.11.6 Vibration Impact Assessment Results

The Throat Area Variations will have slightly different effects on Design Year vibration conditions in the Study Area. Since the Project will involve changes to an existing rail corridor and there will not be a substantially greater number of train operations (doubling or more of the number of events) in the Design Year or any interim conditions, the vibration impact assessment is based on whether the Project will increase vibration levels by more than 3 VdB and also will result in vibration levels that exceed the FTA vibration criteria. There is a potential for vibration levels to increase by more than 3 VdB at receptors relatively close to the tracks (for ex., within 100 feet). At farther distances, slight changes to the track alignment and/or introducing new track turnouts typically will not have a significant effect. Similar to noise, track turnouts increase vibration because they introduce a gap in the rail running surface that the train wheels impact.

Vibration from trains operating between the western terminus of the Project Area and West Station will not be substantially different than existing conditions for all Throat Area Variations. The Worcester Main Line tracks will generally be in the same location as they are now. There will be no new special track work, such as turnouts or crossovers, introduced near vibration-sensitive receptors. Most MBTA trains will travel at a slower speed as they approach and depart West Station. Since vibration is lower with slower trains, vibration levels may decrease slightly for trains that stop there.

Trains operating into and out of the rail yard will be at greater distances away from vibration-sensitive receptors and will be traveling at slower speeds than trains on the Worcester Main Line.

Vibration from trains operating on the Worcester Main Line in the BU area will be similar to existing conditions for all Throat Area Variations, as assessed at the dormitory at 33 Agganis Way (BU-4). Vibration is not assessed at outdoor uses such as Nickerson Field. Other school buildings including the Nutrition Department (BU-6), the Fitness & Recreation Center (BU-7), and Agganis Arena (BU-8) are sufficiently distant from the tracks that vibration levels will be well below the FTA vibration criteria.

Table 5.11-28 summarizes the vibration impact assessment results, and the following describes the potential effects on vibration at the College of Fine Arts (BU-1), the College of General Studies (BU-2) and 10 Buick Street (BU-3), for each Throat Area Variation:

- **3K-HV Variation:** 3K-HV will introduce new track turnouts near the College of Fine Arts (BU-1), the College of General Studies (BU-2), and 10 Buick Street (BU-3), increasing vibration up to 10 VdB. Future vibration levels will exceed the FTA interior vibration criterion at the Concert Hall (BU-1) and will be below the FTA criteria at the College of General Studies and 10 Buick Street.
- **3K-ABC Variation:** 3K-ABC will introduce new track turnouts near the College of General Studies (BU-2), and 10 Buick Street (BU-3), increasing vibration up to 10 VdB. Vibration levels will be below applicable FTA criteria at all receptors.
- **3K-AMP Variation:** Similar to the 3K-HV Variation, 3K-AMP will introduce new track turnouts near the College of Fine Arts (BU-1), the College of General Studies (BU-2), and 10 Buick Street (BU-3), which will increase vibration up to 10 VdB. Future vibration levels will exceed the FTA interior vibration criterion at the Concert Hall (BU-1) and will be below the FTA criteria at the College of General Studies and 10 Buick Street.

Table 5.11-28: Vibration Impact Assessment

Receptor	FTA Criterion	Maximum Interior Vibration Level (VdB, between 4 and 400 Hz)			
		Existing	3K-HV	3K-ABC	3K-AMP
Residences on Wadsworth Street	75	72	72	72	72
College of Fine Arts Concert Hall (BU-1)	65	59	69	59	69
College of General Studies (BU-2)	78	59	69	69	69
10 Buick Street Dormitories (BU-3)	75	64	74	74	74

Source: MassDOT, 2017

Ground-borne noise was evaluated for a concert hall and recording spaces within the BU College of Fine Arts building and for the College of General Studies. Similar to the vibration analysis, the focus of the ground-borne noise assessment was based on whether the Project will significantly affect existing conditions. Table 5.11-29 summarizes the ground-borne noise impact assessment results. Existing ground-borne noise in the concert hall is predicted to exceed the FTA criterion of 25 dBA. With the introduction of track turnouts near the building under Variations 3K-HV and 3K-AMP, ground borne noise levels will further exceed the FTA criterion. Ground-borne noise in the College of General Studies is predicted to be below the FTA criterion for existing and all Throat Area Variations.

Table 5.11-29: Ground Borne Noise Impact Assessment

Receptor	FTA Criterion	Ground-Borne Noise Level (dBA)			
		Existing	3K-HV	3K-ABC	3K-AMP
College of Fine Arts Concert Hall (BU-1)	25	31	41	31	41
College of General Studies (BU-2)	43	31	41	41	41

Source: MassDOT, 2017

Vibration Mitigation for Special Track Work in Boston University Area

Since vibration and ground-borne noise levels will exceed the FTA criteria at the College of Fine Arts concert hall, and because the Project will increase vibration and ground-borne noise by 10 decibels with the 3K-HV or 3K-AMP Variations, mitigation will be needed. To mitigate vibration impact, similar to noise, it will be most effective to reduce the increase in vibration associated with the new track turnouts. Relocating the track turnouts away from sensitive receptors or using a specific turnout design will be effective at mitigating vibration impact. Certain types of track turnouts close the gap in the rail running surface and minimize noise and vibration. These turnouts include movable or spring-loaded parts and will be effective in keeping vibration levels close to existing conditions without turnouts.

5.11.7 Construction Noise and Vibration Assessment

Construction Noise Assessment

Construction activities have the potential to affect noise- and vibration-sensitive receptors in the Study Area. Construction activities that generate vibration have the potential to increase the risk of structural damage to nearby buildings, and construction noise has the potential to cause human annoyance at nearby sensitive uses.

The City of Boston Air Pollution Control Commission regulation (Title 7, Section 50) limits construction noise based on the type of land use (i.e. residential, institutional or commercial) and existing background noise levels. This regulation is consistent with the noise specification used for the Central Artery/Tunnel Project and with the City of Cambridge Noise Ordinance (Ord. 1326, Chapter 8.16.070, adopted May 18, 2009). Although the Project will not involve construction within the City of Cambridge, there will be the potential for construction noise to propagate into Cambridge.

Boston's noise regulations limit construction noise according to the type of land use as shown in Table 5.11-30. At residential and institutional land uses, the noise limit from general construction activities is 75 dBA (L10), which is the sound exceeded 10% of the time, and the maximum noise limit is 86 dBA measured no closer than 50 feet from the noise source. Construction noise impact will only occur if the construction noise levels exceed background levels by 5 dBA, so within areas having high ambient noise levels these noise limits may increase. The maximum noise limit does not apply to impact devices such as pile drivers or pavement breakers. Most non-impact construction equipment generates noise levels of 85 dBA at 50 feet or less. Therefore, the maximum 86 dBA limit essentially requires contractors to use equipment that is well maintained, includes appropriate noise reduction features such as mufflers and baffles, and will not generate unnecessary noise.

The City of Cambridge noise ordinance has similar daytime noise limits as the Boston regulation. Cambridge also prohibits construction that is audible at distance of 50 feet from the lot line from 6 p.m. until 7 a.m., weekdays (9 a.m. on Saturdays and Holidays) and on Sunday unless approval such as a special variance is obtained. Although the Project will not include construction within the City of Cambridge limits, this prohibition may apply due to the potential for audible sound to be received within the City of Cambridge.

There will be a potential need for construction in the evening to minimize conflicts with highway users and reduce the overall construction schedule. The noise specification used for the Central Artery/Tunnel Project included more stringent limits for evening and nighttime construction activities. Similar evening and nighttime noise limits may be necessary for this Project.

Table 5.11-30 City of Boston Construction Noise Regulation

Land Use of Affected Property	L10 Noise Level Limit (dBA)	Maximum Noise Level Limit (dBA)
Residential or Institutional	75	86
Business or Recreational	80	--
Industrial	85	--

Source: City of Boston Air Pollution Control Commission

Construction noise levels were evaluated at a distance of 50 feet from the noise source for different phases of construction including excavation, grading, roadway construction and track construction. Noise levels were calculated using the FHWA's Roadway Construction Noise Model methodology, which accounts for the different equipment used during construction, their maximum noise limits and an acoustic usage factor. At receptors more than 50 feet away from construction, noise levels typically decrease 6 decibels per distance doubling. Table 5.11-31 presents the typical noise levels (L10) for construction at distances of 50, 100 and 500 feet from the equipment. This table shows that noise levels (L10) generally range between 88 and 91 dBA at 50 feet, 82 and 85 dBA at 100 feet and 68 and 71 dBA at 500 feet.

There are many residences and businesses located within 50 feet of the center of construction activities in Allston. In the BU area, school buildings and dormitories will generally be within 100 feet of the nearest point to construction. In Cambridge, residences, businesses and parks will typically be at distances of 500 feet or more from construction. This evaluation shows that construction noise may exceed the City of Boston limits at receptors 100 feet or more from construction. Therefore, construction noise mitigation will be needed to minimize potential impact.

Table 5.11-31: Typical Construction Noise Emissions

Construction Phase	L10 Noise Level at 50 feet (dBA)	L10 Noise Level at 100 feet (dBA)	L10 Noise Level at 500 feet (dBA)
Excavation	90	84	70
Grading	89	83	69
Station Construction	88	82	68
Roadway Construction	91	85	71
Track Construction	88	82	68

Source: MassDOT, 2017

Construction Vibration Assessment

Construction of the Project will involve the use of vibration-generating equipment, such as excavators, heavy dump trucks, jackhammers, hoe rams, a vibratory roller for track construction, drilling and/or impact pile driving. Construction has the potential to cause structural damage when vibration-generating equipment is used in close proximity to nearby buildings. The FTA vibration impact criterion to minimize the risk of structural damage is measured in peak-particle velocity (PPV) in inches per second (in/s). The impact criterion for most buildings is 0.5 in/s unless they are particularly historic, fragile or otherwise sensitive to vibration.

Table 5.11-32 presents the reference PPV vibration level from typical construction equipment and the distance from the equipment where vibration levels will exceed 0.5 in/s. For most equipment, including heavy trucks, excavators, hoe rams and jackhammers, vibration levels will only exceed 0.5 in/s within 8 feet. Vibratory rollers may exceed 0.5 in/s within 14 feet. The most substantial source of vibration will be impact pile driving, which may be needed particularly for the 3K-HV and 3K-AMP Variations that involve construction of an elevated highway or railway. If pile driving is required within 30 feet of buildings, there will be the potential for an increased risk of structural damage and the need to mitigate potential impacts.

Table 5.11-32: Typical Construction Vibration Levels

Construction Equipment	PPV at 25 feet (in/s)	Distance to exceeding FTA criterion of 0.5 in/s (feet)
Heavy Truck	0.076	7
Excavator	0.089	8
Hoe Ram	0.089	8
Vibratory Roller	0.210	14
Jackhammer	0.035	4
Drilling	0.089	8
Pile Driver	0.644	30

Source: MassDOT, 2017

Construction Noise and Vibration Mitigation

Best management practices will be used to minimize construction noise as feasible and reasonable, including the following:

- Assuring that equipment is functioning properly and is equipped with mufflers and other noise-reducing features
- Locating especially noisy equipment as far from sensitive receptors as possible
- Using quieter construction equipment and methods, as feasible
- Using path noise control measures such as temporary noise barriers, portable enclosures for small equipment (i.e. jackhammers and concrete saws)
- Replacing back-up alarms with strobes, as allowed within OSHA regulations, to eliminate the annoying impulsive sound
- Maintaining strong communication and public outreach with adjacent neighbors is a critical step in minimizing impact

To minimize the risk of structural damage associated with impact pile driving, construction methods that generate lower vibration will be needed. These methods include: pre-drilling piles or using vibratory pile driving, and/or performing construction vibration monitoring to minimize risk of exceeding applicable limits.

Given the duration of construction activities for the Project and the relatively close proximity of sensitive receptors, it is recommended that the contractor prepare a Construction Noise and Vibration Control Plan prior to beginning construction. This plan will include detailed predictions of construction noise and vibration levels, requirements for conducting construction noise and vibration monitoring and, if necessary, approaches that will be taken to mitigate potential construction-period noise and vibration impact.

Further information on the methods and criteria used to evaluate construction noise and vibration is presented in the Noise and Vibration Technical Report in Appendix H.

5.12 Wetlands and Waterways

5.12.1 Wetlands No Build

Under the No Build Alternative, the I-90 viaduct will be rehabilitated in the same location. There will be no temporary or permanent alterations or impacts to state and federal resource areas associated with the No Build Alternative.

5.12.2 Wetlands I-90 Urban Interchange Preferred Alternative

With the exception of the stormwater discharge pipes associated with the stormwater management component of the Project, the Preferred Alternative, including rail operations and West Station, will not be located within the Charles River and associated resource areas or Waters of the U.S. subject to protection under the Massachusetts Wetlands Protection Act (MA WPA) and Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, respectively.

State

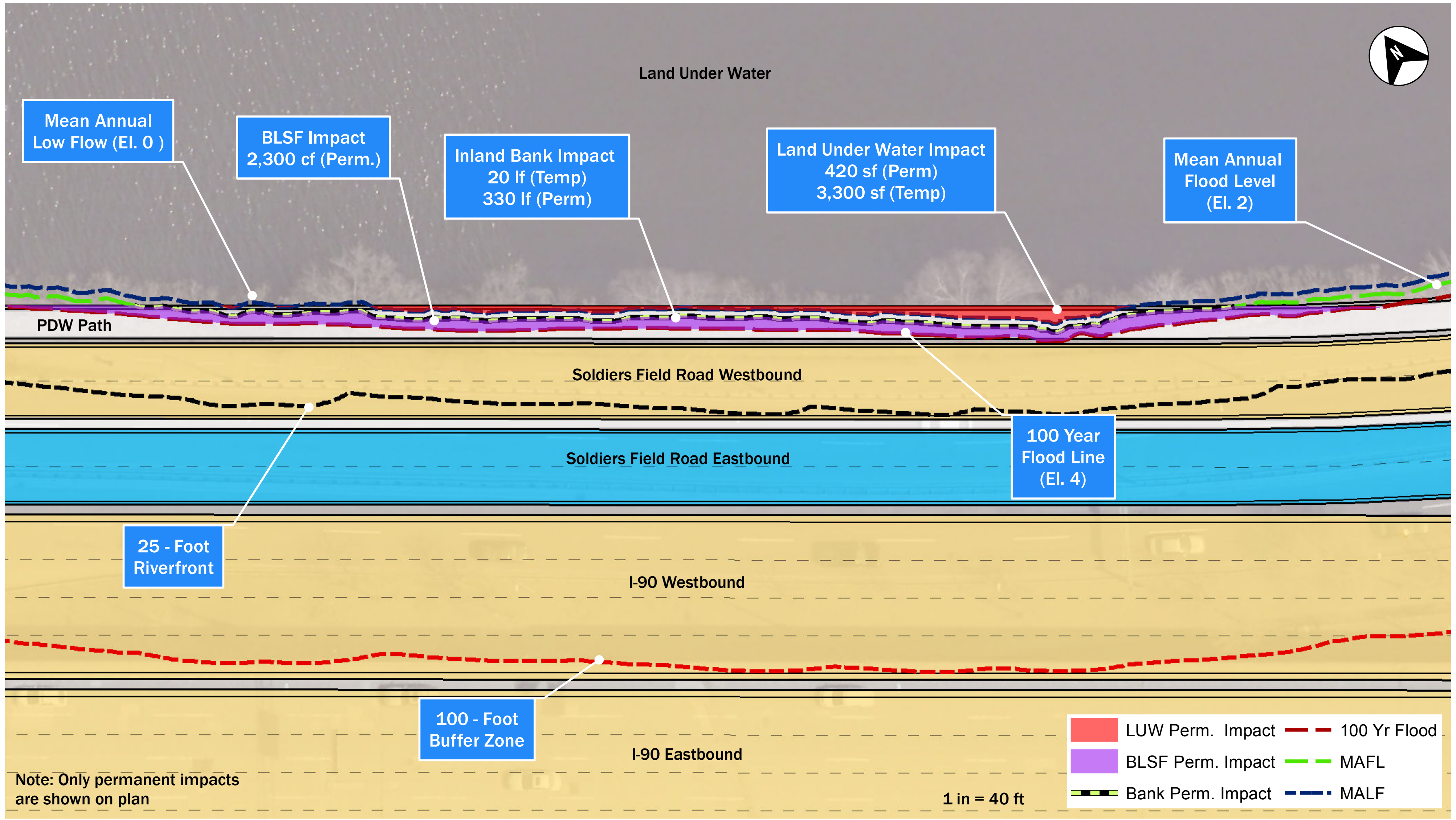
The installation of one new pipe, removal of six pipes and replacement of three stormwater discharge pipes along the Charles River in the Project Area will temporarily and permanently alter state resource areas including 240 sf of Land Under Water (LUW), 90 lf of Bank and Bordering Land Subject to Flooding (BLSF). See Figures 5.12-1 through 5.12-3 for the discharge pipe locations.

Temporary alterations to Bank, LUW and BLSF to install and/or remove the discharge pipes will occur within the work zone. The use of the area along the top of the slope at the Charles River as a temporary work zone will be required. Although the Throat Area portion of the Project is located within the Riverfront Area, Project activities are exempt from Riverfront Area requirements because a Chapter 91 Waterways authorization will be required.

Federal

The installation of one new pipe, removal of six pipes and replacement of three stormwater discharge pipes along the Charles River in the Project Area will temporarily and permanently impact 260 sf of federal navigable Waters of the U.S. Temporary alterations to Waters of the U.S. will occur from the work zone to install and/or remove the discharge pipes. Federal jurisdiction and impacts are the same as Chapter 91 jurisdiction and impacts (see Figures 5.12-4 through 5.12-7).

The removal and/or installation of the discharge pipes will require notification to the U.S. Army Corps of Engineers (USACE) under Section 10 of the Rivers and Harbors Act of 1899 for "the construction of any structure in, over or under any navigable Water of the United States;" and Section 404 of the Clean Water Act for "the discharge of dredged or fill material and discharges associated with excavation into Waters of the U.S."


Land Under Water
Mean Annual Low Flow (El. 0)
BLSF Impact 2,300 cf (Perm.)
Inland Bank Impact 20 lf (Temp) 330 lf (Perm)
Land Under Water Impact 420 sf (Perm) 3,300 sf (Temp)
Mean Annual Flood Level (El. 2)
PDW Path
Soldiers Field Road Westbound
Soldiers Field Road Eastbound
100 Year Flood Line (El. 4)
25 - Foot Riverfront
I-90 Westbound
100 - Foot Buffer Zone
I-90 Eastbound
Note: Only permanent impacts are shown on plan
1 in = 40 ft
LUW Perm. Impact
BLSF Perm. Impact
Bank Perm. Impact
100 Yr Flood
MAFL
MALF

Graphic 5.12-1: 3K-ABC Wetland Impacts

5.12.3 Wetlands Throat Area Variations

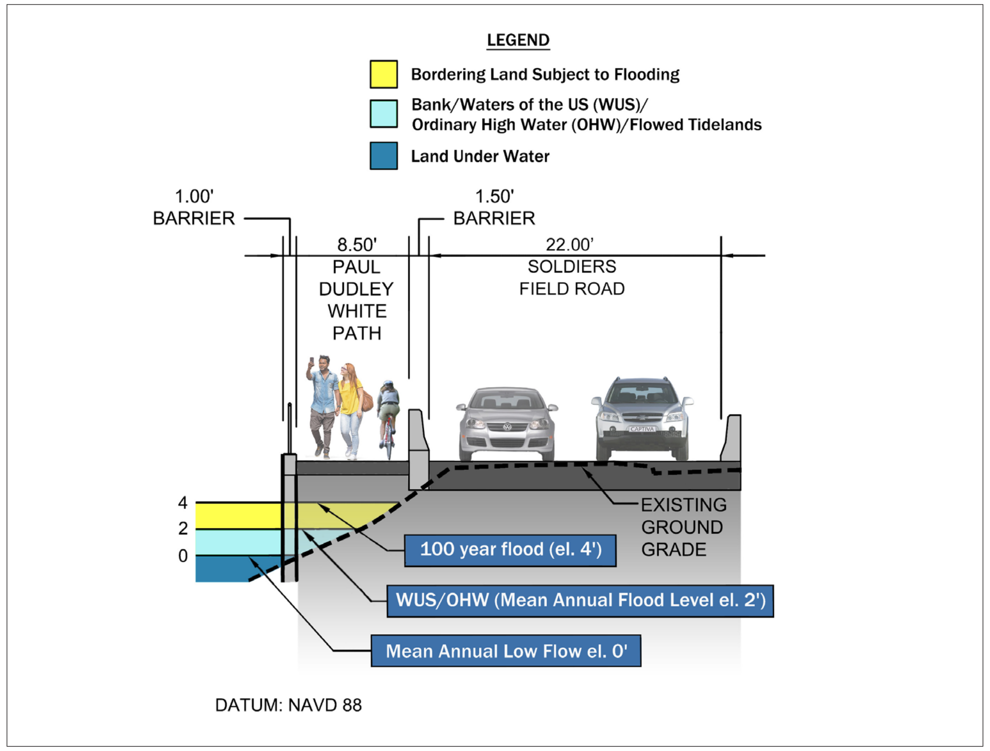
3K-HV and 3K-AMP Variations

There will be no alterations/impacts to state or federal resource areas associated with Variations 3K-HV and 3K-AMP as the limit of both variation layouts will be located at the edge of the existing PDW Path. See Figures 5.12-1 and 5.12-2. The variation layouts will be located above elevation 4 and elevation 2 which represent the farthest landward state and federal jurisdictional resource limit, respectively, of the Charles River. Variation 3K-HV requires work in the 100-foot buffer zone for the construction of SFR and I-90 along with track adjustments to the GJR. The 3K-AMP Variation will also require work within the 100-foot buffer zone to Bank for roadway construction, rail realignment at the GJR Bridge approach, and the reconstruction of the GJR Bridge over SFR.

3K-ABC Variation

For the 3K-ABC Variation, a portion of the PDW Path will be located within the Charles River. See Graphic 5.12-1 and Figure 5.12-3. The portion of the 3K-ABC layout riverward of elevation 4 will be supported by a retaining wall and associated fill, resulting in the direct alteration of LUW, Bank, BLSF and Bank Underlying an Anadromous/Catadromous Fish Run. The wall and fill will also be located below elevation 2 within the federal navigable Waters of the U.S. The wall will extend between 0 and 6 feet riverward beyond elevation 2 and into the Charles River state wetland resources resulting in the permanent alteration of 420 sf of LUW, 330 lf of Bank and Bank Underlying and Anadromous/Catadromous Fish Run, and 2,300 cf of Bordering Land Subject to Flooding. Assuming a 10-foot-wide work zone, temporary alterations to construct the wall will result in 3,300 sf of alteration to LUW and 20 lf of Bank. Dredging may be required for the construction of the retaining wall. The volume of dredge material will be determined during design advancement and will be presented in the FEIR. This variation will also require work within the 100-foot buffer zone to Bank for the roadway construction and reconstruction of the GJR Bridge over SFR.

The alteration to state and federal wetland and waterways resource areas is quantified in Table 5.12-1. Graphic 5.12-2 shows a cross section of Throat Area Variation 3K-ABC relative to resource areas.


LEGEND
Bordering Land Subject to Flooding
Bank/Waters of the US (WUS)/ Ordinary High Water (OHW)/Flowed Tidelands
Land Under Water
1.00' BARRIER
1.50' BARRIER
8.50' PAUL DUDLEY WHITE PATH
22.00' SOLDIERS FIELD ROAD
4
2
0
EXISTING GROUND GRADE
100 year flood (el. 4')
WUS/OHW (Mean Annual Flood Level el. 2')
Mean Annual Low Flow el. 0'
DATUM: NAVD 88

Graphic 5.12-2: Cross section showing 3K-ABC

Table 5.12-1: State and Federal Wetlands and Waterways Impacts

Environmental Factors	Throat Area Variation		
	3K-HV	3K-AMP	3K-ABC
State Wetland Resource Alterations (Roadway/Path)	No alteration	No alteration	**Temporary:** 3,300 sf Land Under Water (LUW), 20 linear feet (lf) Bank **Permanent:** 420 sf LUW (fill) and LUW (dredge*), 330 lf Bank, 2,300 cubic feet Bordering Land Subject to Flooding
State Wetland Resource Alterations (Stormwater Discharge Pipes)	**Temporary:** 200 sf LUW & 80 lf Bank **Permanent:** 40 sf LUW & 10 lf Bank		
Federal Inland Waters of the U.S. Impacts (Roadway/Path)	No alteration	No alteration	**Temporary:** 3,300 sf Waters of the U.S. (WUS) **Permanent:** 1,100 sf WUS
Federal Inland Waters of the U.S. Impacts (Stormwater Discharge Pipes)	**Temporary:** 200 sf WUS **Permanent:** 60 sf WUS		
Chapter 91 Waterways Filled Tidelands Impacts (Roadway/Path)	Conversion of 2.26 acres of non-water dependent roadway use to water dependent (WD) public park use	Conversion of 2.34 acres of non-water dependent roadway use to WD public park use	Conversion of 1.58 acres of non-water dependent roadway use to WD public park use
Chapter 91 Waterways Flowed Tidelands Impacts (Stormwater Discharge Pipes)	**Temporary:** 200 sf flowed tidelands **Permanent:** 60 sf flowed tidelands		
Chapter 91 Waterways Flowed Tideland Impacts (Roadway/Path)	No alteration	No alteration	**Temporary:** 3,300 sf of flowed tidelands **Permanent:** 1,100 sf of flowed tidelands

NOTE: Under the 3K-ABC Variation, the 25-foot Riverfront Area will be altered by the placement of fill and installation of the retaining wall; however, under 310 CMR 10.58 (6) of the MA WPA Regulations, projects that require a Chapter 91 Waterways License are exempt from the Riverfront Area requirements, provided the project obtains a license, permit or authorization under 310 CMR 9.00, Waterways Regulations.

*Dredging may be required for the construction of the retaining wall. The volume of dredge material will be determined during design advancement and will be presented in the FEIR.

5.12.4 Conformance with Performance Standards

The MA WPA thresholds for LUW include provisions that assume the resource areas are significant to wildlife habitat. According to 310 CMR 10.56(4), "A project or projects on a single lot, for which a Notice of Intent is filed on or before November 1, 1987, that cumulatively alter(s) up to 10% or 5,000 square feet (sf) (whichever is less) of land in this resource area found to be significant to the protection of wildlife habitat shall not be deemed to impair its capacity to provide important wildlife habitat functions." In addition, in accordance with 310 CMR 10.54(4), alterations to Bank must not alter more than 10% or 50 lf found to be significant to the protection of wildlife habitat.

For calculating alterations to a lot, the regulations consider lots to have a definite boundary, and the lot would be considered the entire Charles River Reservation. For purposes of calculating alterations to the existing resources, the area between the River Street and BU Bridges was used, where LUW was estimated at 45 acres, vegetated Bank at 4,000 lf and BLSF at 16,500 cf.

Highway and Streets

Stormwater Discharge Pipes

The Preferred Alternative will temporarily and permanently alter 240 sf of LUW and 90 lf of Bank in conjunction with the removal and installation of the stormwater discharge pipes.

Land Under Water

The total 240 sf temporary and permanent alterations to LUW will result in less than 10% and 5,000 sf of LUW in the Project Area; therefore, temporary and permanent alterations to LUW in conjunction with the stormwater discharge pipe installation will be below thresholds and will meet the performance standards for LUW. Dredging within LUW may be required for the wall and installation. Quantification will be provided in the FEIR.

Bank

Although the total alteration to Bank will be 90 lf and exceeds the 50 lf threshold, the temporary and permanent alterations to Bank will not result in the long-term destruction of vegetation and wildlife habitat because the pipes will be located at the toe of the armored rock portion of the lower slope and not within the vegetated portion of the Bank. The discharge pipes will not impair the water carrying capacity, ground and surface water quality and/or the capacity of the land to provide breeding habitat.

Bordering Land Subject to Flooding

Impacts to BLSF associated with the installation of one new pipe, removal of six pipes and replacement of three pipes will not displace flood storage capacity.

Throat Area Variations

3K-HV and 3K-AMP

There will be no alterations or impacts to state and federal wetland resource areas associated with Throat Area Variations 3K-HV and 3K-AMP. The above-referenced impacts (highway and streets) to LUW and Bank represent the total impacts for both 3K-HV and 3K-AMP as these Throat Area Variations do not result in additional impacts.

3K-ABC

The following sections discuss alterations to state wetland resource areas with respect to the performance standards set forth in the MA WPA, for temporary and permanent alterations to LUW, Bank, Bank Underlying an Anadromous/Catadromous Fish Run and BLSF associated with the 3K-ABC Variation. This variation places a portion of the PDW Path within the state wetland resource areas of the Charles River.

The 3K-ABC layout includes a retaining wall and fill along the vegetated Bank of the river, resulting in the permanent alteration of 420 sf of LUW, approximately 330 lf of Bank and Banks Underlying an Anadromous/Catadromous Fish Run, and 2,300 cubic feet of BLSF. Temporary alterations to construct the wall will be 3,300 sf of LUW and 20 lf of Bank.

Land Under Water and BLSF

The 3,960 sf of temporary and permanent alteration to LUW from the retaining wall and fill, and stormwater discharge pipes associated with the 3K-ABC Variation, will be below the 5,000 sf/10% thresholds and will meet the performance standards for LUW (310 CMR 10.56).

The 2,300 cubic feet of permanent impact to BLSF from the 3K-ABC Variation alteration will exceed the 10% threshold for BLSF and will not meet the performance standards for BLSF (310 CMR 10.57), if the BLSF is found to be significant to wildlife habitat.

Bank

The placement of the wall and associated fill is considered an activity that will result in the destruction of vegetation along the Bank, while also changing the physical characteristics of the vegetated slope along the river. Within the Project Area, there is approximately 4,000 lf of vegetated Bank along the river, with 400 lf representing 10% of the total bank length. Therefore, the 440 lf of temporary and permanent Bank alteration will exceed the 50 lf Bank threshold if the Bank is found to be significant to wildlife habitat.

Portions of the Project may qualify as a Limited Project under 310 CMR 10.53 (3) (l) where the PDW Path would be considered a water dependent use. The determination of Limited Project status will be at the discretion of the issuing authority, the Boston Conservation Commission. If the PDW Path portion of the Project is determined to be Limited, then the Commission may issue an Order of Conditions allowing the alteration. The following factors are considered when determining if project activities qualify as limited: magnitude of the alteration and significance of the project site to the interests of the WPA; reasonable alternatives to the proposed activity; and the extent to which impacts are minimized and provisions are made for mitigation.

In addition to wildlife habitat significance, Banks are presumed significant to public or private water supply, ground water supply, flood control, storm damage prevention, pollution prevention and fisheries protection. Where banks are man-made, they are likely to be significant to flood control and storm damage prevention. Where banks are partially or fully vegetated, they maintain the Bank stability and protect water quality by reducing erosion and sedimentation. Banks provide shade that moderates water temperatures, provides breeding habitat, shelter or escape cover and food, and migratory and over-wintering areas, all of which are significant to fisheries protection.

Banks are assumed to be significant to all of the interests listed above. However, specific to the section of the Charles River in the Project Area, flood control, storm damage prevention, pollution prevention, and protection of fisheries and wildlife habitat are the applicable interests. The lower section of the Bank is stabilized with rocks. The remainder contains vegetative cover, thereby eliminating erosion and resulting sedimentation in to the river. The vegetation and trees along the Bank provide shade and cover as breeding habitat. The vegetation also provides food, shelter, and migratory and breeding areas for wildlife. Lower growth bushes provide burrowing habitat. The rocks provide crevices suitable for shelter for amphibians and wildlife.

For alterations to Bank, a detailed wildlife habitat evaluation must be performed in order to determine if the functions and values of the Bank provide significant wildlife habitat. If the Bank is found significant to wildlife habitat, then the 3K-ABC Variation may require a variance under the MA WPA for the alteration to more than 50 lf of Bank that is found to be significant to wildlife habitat.

Banks of River Underlying an Anadromous/Catadromous Fish Run

The Charles River is mapped as an Anadromous and Catadromous Fish Run. In accordance with 310 CMR 10.35, the fish run is significant to the protection of marine fisheries. The fish represent renewable protein sources that provide recreation, aesthetic and commercial benefits, and food sources for other organisms. The critical factors for the protection of the fish run include the fish, accessibility of spawning area, volume or rate of flow of water within the spawning area and migratory routes, and spawning and nursery grounds.

The regulations presume that the Bank is significant to the protection of marine fisheries, and a project may not have an adverse effect on the fish run by:

- Impeding or obstructing migration of fish unless the Massachusetts Division of Marine Fisheries (DMF) has determined that such impeding or obstructing is acceptable;
- Changing volume or rate or flow of water within the fish run; and
- Impairing the capacity of spawning or nursery habitats necessary to sustain various life stages of fish.

If the Bank Underlying the Anadromous/Catadromous Fish Run is found to be significant to marine fisheries, a determination by the DMF must be made in order to determine if the alteration to the Bank is acceptable.

Federal Navigable Inland Waters of the U.S.

Federal Waters of the U.S. (WUS) jurisdiction includes the waterway and extends to OHW or elevation 2. The Preferred Alternative will temporarily impact 200 sf of Waters of the U.S. in conjunction with the construction activities associated with removing and installing the stormwater discharge pipes and permanently alter 60 sf of Waters of the U.S.

Temporary impacts associated with the construction of the retaining wall and placement of fill associated with Throat Area Variation 3K-ABC will result in temporary impacts to 3,300 sf of Waters of the U.S. Permanent impacts associated with the wall and fill will be 1,100 sf of WUS.

Authorization from USACE will be required under Section 10 of the Rivers and Harbors Act of 1899 for the construction of any structure in, over or under any navigable WUS and Section 404 of the Clean Water Act for the discharge of dredge or fill material in Waters of the U.S. The storm drain pipe installation work can be authorized under Massachusetts General Permit #9 (Utility Line Activity) as a Self-Verification activity for 0 to 5,000 sf of impact to Waters of the U.S. The retaining wall and fill can be authorized under General Permit #10 as a Linear Transportation Project requiring Pre-Construction Notification (PCN) for work in a navigable water of the U.S. Dredging below OHW can be authorized under MGP #5 (Dredging).

To be eligible for coverage under the General Permit, a project must meet a number of General Permit (GP) conditions including: Condition #4 that requires projects to avoid, minimize and compensate for unavoidable impacts to ensure that the net adverse effects of a project are no more than minimal; Condition #6 that requires coordination under Section 106 of the National Historic Preservation Act; Condition #10 that requires no interference with navigation; Condition #18 that requires time of year/window restrictions; Condition #19 (Aquatic Life Movements) that requires no disruption to the migration of species; and Condition #23 that requires avoiding and minimizing impacts to Spawning Breeding and Migratory Areas.

5.12.5 Waterways No Build

The No Build Alternative will involve the rehabilitation of the existing I-90 viaduct. This activity qualifies as Maintenance, Repair and Minor Project Modifications under the provisions of the Waterways Regulations at 310 CMR 9.22 (1), Maintenance and Repair of Fill and Structures. No Chapter 91 license or amendment will be required for maintenance or repair of existing public transportation facilities and associated drainage systems, as necessary to preserve or restore the serviceability of such facilities for the original use. Assuming the viaduct will be rehabilitated in place and there will be no structural alteration or change in dimensions in size from what was approved, no Chapter 91 license or amendment will be required for the rehabilitation of the existing I-90 viaduct.

5.12.6 Waterways I-90 Urban Interchange Preferred Alternative

Filled tidelands are generally located in an area between OHW and 100 feet inland from the shore, with some areas extending up to 250 feet landward. See Figures 5.12-4 through 5.12-7. Project elements will be located within the filled tidelands of the Charles River and will be subject to Chapter 91 licensing. This work includes, but is not limited to, the realignment of SFR to create more parkland and the PDW Path improvements.

The development of the parkland along the Charles River, the development of SFR and the construction of I-90 were all approved by Legislative Authorization. All Project elements are consistent with these Legislative Authorizations.

With the exception of the stormwater discharge pipes associated with the stormwater management component of the Project, the Project elements associated with the Preferred Alternative will not be located within the flowed tidelands of the Charles River. The stormwater management component of the Project involves the removal of six discharge pipes, the replacement of three outfalls, and the installation of one new outfall. Impacts to filled and flowed tidelands are quantified below and shown on Figures 5.12-4 through 5.12-7.

Rail Operations and West Station

No work associated with West Station will be located in filled tidelands; therefore, no Chapter 91 approvals will be required. Proposed work associated with rail operations in filled tidelands includes a new rail bridge located over SFR for the 3K-AMP and 3K-ABC Variations. 3K-HV realigns a portion of GJR tracks to the north within jurisdictional filled tidelands. All of these activities will require approval under the DEP Chapter 91 Waterways Program.

5.12.7 Waterways Throat Area Variations

All three variations involve a change in use of tidelands from roadway to new public open space. The new public open space will be a waterfront park, created by shifting SFR away from the Charles River; the creation of the park is considered a water-dependent use and benefit to the public. The newly created public parkland within Chapter 91 Jurisdiction will be 2.26 acres under 3K-HV, 2.34 acres under 3K-AMP and 1.58 acres under 3K-ABC. All of the created open space parkland represents a net increase in parkland within Chapter 91 jurisdiction and does not include existing public parkland in the Project Area.

The construction of the I-90 Interchange and all Throat Area Variations will require Chapter 91 authorization for new structures within filled tidelands. Under all variations, the Project will be considered a Nonwater-Dependent Infrastructure Facility and must comply with the Standards for Nonwater-Dependent Infrastructure Facilities at 310 CMR 9.55. These standards are addressed at the end of this section. The I-90 Interchange and all variations must also meet the Categorical Restrictions on Fill and Structures at 310 CMR 9.32 discussed below.

Table 5.12-2: Chapter 91 Impacts

Throat Area Variation	Filled Tidelands	Flowed Tidelands
3K-HV	Change in use of filled tidelands from roadway to Park 2.26 acres	**Storm Drain Pipes** **Temporary:** 200 sf flowed tidelands **Permanent:** 60 sf flowed tidelands
3K-AMP	Change in use of filled tidelands from roadway to Park 2.34 acres	**Storm Drain Pipes** **Temporary:** 200 sf flowed tidelands **Permanent:** 60 sf flowed tidelands
3K-ABC	Change in use of filled tidelands from roadway to Park 1.58 acres	**Storm Drain Pipes** **Temporary:** 200 sf flowed tidelands **Permanent:** 60 sf flowed tidelands **Roadway** **Temporary:** 3,300 sf of flowed tidelands **Permanent:** 1,100 sf of flowed tidelands

Categorical Restrictions on Fill and Structures

The I-90 Interchange and all Throat Area Variations include the removal, replacement and/or installation of new storm drain discharge pipes, resulting in temporary impacts to 200 sf of flowed tidelands (construction-term work) and permanent impact of 60 sf. Discharge pipes are considered water-dependent uses and serve a proper public purpose (310 CMR 9.31 (2) (a)). The discharge pipe improvements meet the Categorical Restrictions on Fill and Structures because installation of drainage or utility structures necessary to accommodate modifications to existing public roadways is allowed under 310 CMR 9.32 (2) (b).

3K-HV and 3K-AMP Variations

Both the 3K-HV and 3K-AMP Variations meet the Categorical Restrictions on Fill and Structures as the Project will be located within filled tidelands, and fill or structures for any use on previously filled tidelands are allowed under 310 CMR 9.32 (1) (a) 1. See Figures 5.12-5 and 5.12-6 for Chapter 91 impacts that would result from Variations 3K-HV and 3K-AMP, respectively.

3K-ABC Variation

Work in filled tidelands for the 3K-ABC Variation meets the Categorical Restrictions on Fill and Structures as described above. See Figure 5.12-7 for Chapter 91 Waterways impacts associated with the 3K-ABC Variation.

The 3K-ABC Variation requires a retaining wall and associated fill within flowed tidelands of the Charles River. Flowed tidelands are defined as watersheet below elevation 2, the OHW of the Charles River. The construction of the wall will temporarily impact 3,300 sf of flowed tidelands; the wall will permanently impact 1,100 sf of flowed tidelands of the Charles River. The retaining wall and fill will support the PDW Path. The PDW Path portion of this variation meets the Categorical Restrictions on Fill and Structures as structures to accommodate public pedestrian access on flowed tidelands are allowed, provided that it is not reasonable to locate such structures above the high water mark or within the footprint of existing pile-supported structures or pile fields in accordance with (310 CMR 9.32 (1) (a) 3).

Standards for Nonwater-Dependent Infrastructure Facilities

Construction of the Preferred Alternative and all Throat Area Variations will result in impacts to filled and flowed tidelands. The Project is considered a Nonwater-Dependent Infrastructure Facility. As such it must meet the Standards for Nonwater-Dependent Infrastructure Facilities at 310 CMR 9.55.

An Infrastructure Facility is a facility that produces, delivers or otherwise provides electric, gas, water, sewage, transportation or telecommunication services to the public. (See 310 CMR 9.02.) The regulations provide that Infrastructure Facilities need not meet the standards for: “Conservation of Capacity for Water-Dependent Use (310 CMR 9.51), “Utilization of Shoreline for Water-Dependent Purposes (310 CMR 9.52), and “Activation of Commonwealth Tidelands for Public Use (310 CMR 9.53).

Instead, pursuant to 310 CMR 9.55, a proposal for an Infrastructure Facility shall include “mitigation and/or compensation measures as deemed appropriate by the [DEP] to ensure that all feasible measures are taken to avoid or minimize detriments to the water-related interests of the public.”

The Waterways Regulations at 310 CMR 9.55(1) list six potential water-related interests of the public that should be evaluated in connection with the permitting of an Infrastructure Facility:

- (a) protection of maritime commerce, industry, recreation and associated public access;
- (b) protection, restoration and enhancement of living marine resources;
- (c) attainment of water quality goals;
- (d) reduction of flood and erosion-related hazards on lands subject to the 100-year storm event or to sea level rise, especially those in damage-prone or natural buffer areas;
- (e) protection and enhancement of public views and visual quality in the natural and built environment of the shoreline;

- (f) preservation of historic sites and districts, archaeological sites, and other significant cultural resources near waterways.

In addition, the Waterways Regulations at 310 CMR 9.55(2) define the requirements for open space and recreation:

> All nonwater-dependent use projects consisting of infrastructure facilities on tidelands or Great Ponds shall take reasonable measures to provide open spaces for active or passive recreation at or near the water's edge, wherever appropriate. Such measures may be provided by any means consistent with the need to avoid undue interference with the infrastructure facilities in question, and to protect public health, safety or the environment.

Water Related Interests

Protection of Maritime Commerce, Industry, Recreation and Associated Public Access. No Maritime Commerce and/or Industry is located in the Project Area. The Preferred Alternative and all of the Throat Area Variations provide an increase in parkland to the Charles River Reservation in the Project Area. They all facilitate public access via new bicycle/pedestrian connections from the Project Area to the PDW Path within the Charles River Reservation.

Protection, Restoration and Enhancement of Living Marine Resources. Under the 3K-HV and 3K-AMP Variations, there will be no impact to marine resources. Under 3K-ABC, time-of-year restrictions, depending on the specific species, may be imposed during construction of the retaining wall to avoid seasonal migration, spawning and impacts to young fish to avoid nursery habitat impacts. Construction techniques that minimize sedimentation, turbidity and noise impacts will be provided to mitigate potential impacts to fisheries in the river.

Attainment of Water Quality Goals. MassDEP has developed Stormwater Management Standards to address water quality (pollutants) and water quantity (flooding, low base flow and recharge) that must be met by the Project. The Project will be designed to meet the MassDEP Stormwater Standards. In addition, BMPs will be employed to protect the river during construction by implementing a Stormwater Pollution Provention Plan (SWPPP). The SWPPP, which consists of text and plans, is required by the U.S. EPA for coverage under their NPDES CGP for disturbance of more than one acre of land where discharges could enter Waters of the U.S. The SWPPP will include specific practices for preventing erosion, preventing pollutants from entering the river, and controlling sediment so it does not migrate from the work area. Variation 3K-HV will meet the targeted phosphorous load reduction for drainage discharges to the Charles River. Due to space limitations, Variations 3K-AMP and 3K-ABC will not meet the targeted phosphorous load reductions.

Reduction of Flood and Erosion-Related Hazards on Lands Subject to the 100-Year Storm Event or to Sea Level Rise Especially Those in Damage-prone or Natural Buffer Areas. Under all Throat Area Variations, there will be minor impact to Land Subject to the 100-Year Storm Event associated with the stormwater discharge pipe work. This work will not result in long-term impacts on flood control. The Project is not located in a damage prone or natural buffer area.

Impacts to the 100-year flood zone, under the 3K-ABC Variation, will include portions of the PDW Path supported by a retained fill section on land subject to the 100-year storm event, resulting in the loss of flood storage volume or flood storage capacity. Any filling of flood plain will require mitigation by creating an equal volume of flood plain elsewhere in the Project Area in accordance with MA WPA performance standards for BLSF.

Protection and Enhancement of Public Views and Visual Quality in the Natural and Built Environment of the Shoreline. Enhancement of public views and visual environment is discussed extensively in Sections 5.3 and 5.4. Under the Preferred Alternative and all Throat Area Variations, public views and the visual quality in the natural and built environment of the shoreline will be enhanced. The perspective of the I-90 Interchange from Cambridge Street will be altered as I-90 itself will be shifted further to the south, more distant from Cambridge Street, and consequently, less visible. The existing ramp structures will be removed, Cambridge Street will be lowered to existing grade, and the street will be straightened, creating a continuous view and an improved sense of visual orientation. The visual environment will change from a multi-level highway interchange to a walkable commercial or residential street. SFR will be relocated to the west and the resulting parkland along the Charles River Reservation will provide a "visual gateway" to the Project Area for drivers approaching from both the north and the south as well as for pedestrians and bicyclists on the PDW Path.

Preservation of Historic Sites and Districts, Archaeological Sites and Other Significant Cultural Resources near Waterways. Under the Preferred Alternative and all Throat Area Variations, the Project will be coordinated with the Massachusetts Historical Commission (MHC) and the State Historic Preservation Office (SHPO) to ensure compliance with Section 106 of the National Historic Preservation Act of 1966, as amended.

Provide Open Spaces for Active or Passive Recreation at or near the Water's Edge, Wherever Appropriate (310 CMR 9.55(2)). The Preferred Alternative and all Throat Area Variations will provide an increase in parkland to the Charles River Reservation in the Project Area and facilitate public access via new bicycle/pedestrian connections from the Project Area to the PDW Path within the Charles River Reservation.

5.13 Floodplain

Impacts to the 100-year floodplain or flood zone within the Project Area were assessed through reference to the latest Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for Suffolk County, Massachusetts. The maps that cover the Project Area include 25017C0557G and 25017C0576E, both with an effective date of September 25, 2009. The Preferred Alternative and Throat Area Variation plans were compared to the FEMA FIRM maps to determine impacts to the flood zone. The 100-year flood zone, mapped at elevation 4 (NAVD88), is contained within the banks of the Charles River. It does not extend onto the adjacent upland area of SFR or the PDW Path.

In the Project Area, the 100-year floodplain associated with the Charles River is designated as BLSF, a jurisdictional resource area as defined at 310 CMR 10.57.

The following sections discuss impacts to the flood zone associated with the No Build, the Preferred Alternative and the three Throat Area Variations.

5.13.1 No Build

Under the No Build Alternative, the I-90 viaduct will be extensively rehabilitated and none of the work will occur within the flood zone. The conditions of the 100-year floodplain in the Project Area will remain as they currently exist in the No Build Alternative. There will be no short-term upgrades or maintenance activities occurring within the 100-year floodplain under the No Build Alternative.

5.13.2 I-90 Urban Interchange Preferred Alternative

Highway and Streets

With the exception of stormwater drainage pipes, Project elements associated with the Preferred Alternative, including rail operations and West Station, will not be located within the 100-year flood zone. The 100-year flood zone is contained within the riverbank. There will be no impacts to the 100-year flood zone associated with the I-90 Urban Interchange portion of the Project.

5.13.3 Throat Area Variations

3K-HV and 3K-AMP Variations

The 3K-HV and 3K-AMP Variations will not impact the 100-year flood zone. Neither variation proposes structures or fill within the flood zone located below elevation 4 (NAVD88). Therefore, there will be no impacts to Charles River flood zone.

3K-ABC Variation

Portions of the PDW Path will be supported by a retaining wall and associated fill below elevation 4, resulting in the loss of flood storage volume or capacity. In accordance with the MA WPA, compensation for loss of flood storage must be a volume not previously used for flood storage and incrementally equal to the volume of flood water at each elevation. The volume must have an unrestricted hydraulic connection to the same waterway and within the same reach of the river.

5.14 Navigation

The elevation below OHW (2 feet NAVD88) in the Charles River is considered navigable under both federal and state regulations. Section 10 of the federal Rivers and Harbors Act of 1899 requires that regulated activities conducted below the OHW elevation of navigable waters of the U.S. be approved/permitted by USACE. The state Chapter 91 Waterways Regulations identify the water sheet below OHW as flowed tidelands subject to navigation and permitting under the Chapter 91 regulations.

5.14.1 No Build

Under the No Build Alternative, there will be no impact to navigation. The existing viaduct will be rehabilitated, and no work will occur within the Charles River. No short-term upgrades or maintenance activities are expected to occur within the navigable waterway under the No Build Alternative.

5.14.2 I-90 Urban Interchange Preferred Alternative

Highway and Streets

The Project elements associated with the Preferred Alternative, including rail operations and West Station, will not be located within the navigable waterway. One new discharge pipe will be constructed in the river, but it will have no long-term affect on navigation as it will not extend into the navigable waterway. Therefore, there will be no impacts to navigation associated with the I-90 Urban Interchange portion of the Project.

5.14.3 Throat Area Variations

3K-HV and 3K-AMP Variations

Construction of the 3K-HV and 3K-AMP Variations will not result in permanent impacts to navigation in the Charles River. No portion of the Project will be located within the navigable waterway.

3K-ABC Variation

The 3K-ABC Variation will be located within the navigable waterway riverward of OHW/WUS. The introduction of a wall will extend 6 feet into the navigable waterway beyond OHW/WUS, but is not expected to interfere with navigation in the waterway. The construction of the retaining wall and associated fill may be performed from the waterway by barge, and associated equipment may require temporary occupation of portions of the navigable waterway. Temporary closures of portions of the river along the bank may be required for safety purposes during construction.

5.15 Fisheries

5.15.1 No Build

Under the No Build Alternative, the I-90 viaduct will be rehabilitated. None of the work will occur within the Charles River; therefore, there will be no impacts to fisheries associated with the No Build Alternative.

5.15.2 I-90 Urban Interchange Preferred Alternative

Highway and Streets

There will be temporary impacts associated with the construction of one new discharge pipe, the replacement of three discharge pipes and the removal of six discharge pipes, resulting in minimal disturbance to fisheries. None of the proposed work associated with rail operations and West Station will be located within the Charles River. Therefore, there will be no impacts to fisheries resources associated with these Project components.

5.15.3 Throat Area Variations

3K-HV and 3K-AMP Variations

There will be no impacts to fisheries from the 3K-HV or 3K-AMP Variations.

3K-ABC Variation

The 3K-ABC Variation will result in impacts to fisheries and Banks Underlying the Anadromous/Catadromous Fish Run within the Charles River from the installation of the retaining wall to support the PDW Path.

Construction of the retaining wall and associated fill will require in-water work that may result in temporary impacts to fish habitat during construction. To avoid disturbance to the anadromous fish run, restrictions on the time-of-year of construction activity may be required. Permanent impacts to fish habitat may result from the elimination of feeding areas for anadromous/catadromous fish during transit as they migrate up and down stream. During Project construction, sediments may be suspended in the water column that could irritate gills of fish or smother eggs.

5.16 Threatened and Endangered Species

There are no federal or state listed species within the Project Area. The species of concern include common wildlife only. Impacts are evaluated based on the potential to cause a temporary or permanent loss of habitat, or a measurable disturbance to local wildlife or threatened and endangered (T&E) species.

The positive and negative effects were determined to be minimal. Minimal impacts are those that may affect individuals, either directly or through changes in habitat quality, but have no detectable, permanent effect at the population level.

5.16.1 No Build

Under the No Build Alternative, the viaduct will be rehabilitated. The No Build Alternative will have no impact on wildlife resources and no impact on T&E species in the Project Area. There will be no permanent loss of habitat, no change in habitat quality, and no change in the opportunity for wildlife to cross Project Area roadways. Wildlife will continue to be able to travel along the limited habitat of the Bank of the Charles River. Passage across Project Area roadways will remain as it does today.

Temporary impacts on wildlife from the No Build Alternative will consist of increased levels of disturbance caused by construction activities; however, common wildlife is highly adaptable. No long-term impacts are associated with the construction of the No Build Alternative.

5.16.2 I-90 Urban Interchange Preferred Alternative and Throat Area Variations

For the Preferred Alternative and all of the three Throat Area Variations, there will be no impact on wildlife resources and no impact on T&E species in the Project Area. There will be no permanent loss of habitat, no change in habitat quality, and no change in the opportunity for wildlife to cross Project Area roadways.

Temporary impacts to wildlife associated with construction will consist of increased levels of disturbance caused by increased noise and activity due to Project construction. Due to highway and rail operations, the Project Area is highly disturbed and the incremental addition of new disturbance sources would unlikely affect resident wildlife unless construction were to continue through the night, which is not currently planned or expected. Animals are most likely to cross the Project Area during the nighttime hours when traffic volumes drop and darkness provides cover. The noise, activity and lighting associated with nighttime construction activities will discourage animals from crossing the Project Area. If night construction were to occur, there will be small, temporary negative impacts to common wildlife.

5.17 Proposed Stormwater Management

The Preferred Alternative and all three Throat Area Variations will meet regulatory stormwater standards. Variation 3K-HV will not require stormwater pumping. It will maintain space for stormwater treatment, allowing for an exceedance of the phosphorous removal rate target. Variations 3K-AMP and 3K-ABC will require pumping of stormwater, will have constrained areas for stormwater treatment, will not provide adequate shoulder width on the roadway to safely contain stormwater flow, and will not meet the phosphorous removal target rate. Under all three Throat Area Variations, the Project will result in a decrease in the amount of existing impervious cover and an increase in the level of treatment compared to existing conditions.

Regulatory Requirements

Stormwater management and quality are regulated at both the state and federal levels, and there are a number of regulations and policies setting the standard for achieving water quality in stormwater discharges. This section outlines the regulations and policies that govern stormwater design, the options for treating stormwater runoff, and a summary of how the Project will be designed to meet the various standards and policies. The Stormwater Management Technical Appendix M provides additional details regarding the stormwater management design, calculations and assumptions.

At the federal level, the U.S. EPA regulates water quality under the Total Maximum Daily Load (TMDL) Program and stormwater discharges from regulated municipal separate storm sewer systems (MS4) under the National Pollutant Discharge Elimination System (NPDES) Program, where the system operator must develop and implement a Stormwater Management Plan (SWMP). The U.S. EPA also regulates stormwater discharges associated with certain industrial sectors under the NPDES Multi Sector General Permit. In addition, the U.S. EPA regulates construction-term stormwater discharges under the NPDES Construction General Permit for the disturbance to one or more acres of land where stormwater discharges enter a water of the U.S.

At the state level, projects subject to the MA WPA (discussion provided in Section 5.12) are required to meet the MassDEP Stormwater Standards contained in 310 CMR 10.05 of the MA WPA and also the MassDEP *Massachusetts Stormwater Handbook* (2008).

Impervious Cover

The Preferred Alternative and all three Throat Area Variations result in a decrease in impervious area. On its own, this decrease represents an improvement to water quality as the amount of impervious cover directly contributes to downstream water quality impairments. Table 5.17-1 summarizes the existing and proposed impervious areas for the Project.

Table 5.17-1: Project Area Proposed Impervious Land Cover

	Impervious Area (Acres)			Impervious Cover (%)		
	3K-ABC	3K-AMP	3K-HV	3K-ABC	3K-AMP	3K-HV
Existing	78.4	78.4	78.4	56%	56%	56%
Proposed	73.7	72.1	74.8	52%	51%	53%
Difference	**-4.7**	**-6.3**	**-3.6**	**-4%**	**-5%**	**-3%**

Overview of Stormwater Management

As discussed in Chapter 4.17, there are various stormwater management system operators within the Project Area. In addition to MassDOT, BWSC, MBTA, DCR, and to some extent, Harvard University, as owners and operators of their respective systems, have roles in the development of the stormwater management design. The Conceptual Jurisdictional Boundaries are shown on Figure 5.2-1. Consequently, the design will represent a combination of design approaches among these five entities on a Project-wide basis. Although the limits of jurisdiction among these entities will be distinct and defined by property rights established during the Project design process, the attainment of stormwater management goals will be evaluated and measured on a Project-wide basis without regard to proposed jurisdictional boundaries.

The approximate jurisdictional boundaries for MassDOT elements of the Project encompass the proposed I-90 mainline layout, I-90 exit and entrance ramps, and a relatively small portion of the proposed street network north of I-90. MBTA's jurisdiction covers the commuter rail corridor, the proposed West Station limits, and the proposed commuter rail layover yard. DCR's jurisdiction includes the proposed relocated SFR and proposed open space created between SFR and the Charles River. Cambridge Street and the proposed street network are under City of Boston jurisdiction, as are the connections between West Station and the existing street network to the south of the Project. Harvard University Beacon Yards, LLC currently owns most of the land within the Project Area. Property rights for each entity will be negotiated with Harvard. Harvard will have jurisdiction over the land parcels created by the street network and will have air rights over both the rail layover yard and I-90.

Each of the five entities approach stormwater management and water quality differently based on their own design and review requirements, standardized details and specifications, construction and maintenance protocols, and land use/potential pollutants.

5.17.1 Water Quality Treatment

Each stormwater entity requires specific treatment systems or Best Management Practices (BMPs) to achieve water quality criteria for their respective systems. The following section discusses the treatment options targeted by each operator and the corresponding conceptual design developed for that geographic location. The main goal for all operators is to infiltrate as much stormwater as possible in order to recharge or replenish the groundwater and filter out pollutants. Infiltration systems collect runoff and allow stormwater to filter and recharge into the underlying soil. See Figures 5.17-1 through 5.17-4 for potential BMP types and locations within the Project Area.

The feasibility and applicability of certain BMPs to treat stormwater runoff, especially for the purpose of infiltration and recharge, will be dependent on a number of critical design factors including the suitability of soils, permeability of the soil and depth to seasonal high groundwater, presence or absence of oil and hazardous materials, and the limiting layer (clay/bedrock). Specifically in the Project Area, adequate space in which to locate the system will be constrained due to land ownership and future development plans. The selection of practices to treat runoff and meet water quality standards will be determined by field investigations to understand the influence of the critical design factors. Detailed infiltration evaluations will be completed after borings and test pits are performed in locations where infiltration will be proposed. The results of this information will identify maximum water table fluctuations, hydraulic conductivities and site-specific geologic information that will be used to evaluate long-term hydrogeologic effects. Detailed subsurface investigations will be performed during the 25% design in order to determine these conditions.

The feasibility of infiltration BMPs will also be dependent on the amount of reportable concentrations (RCs) of contaminants as established by the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000. A Phase 1 Environmental Site Assessment of the Project Area was conducted in accordance with ASTM E1527-13 to identify: recognized environmental conditions (RECs), which are conditions that have potential for a past, current, or future release of oil or hazardous materials (OHM); historic RECs (HRECs), which are past releases of OHM that have achieved regulatory closure without conditions; controlled RECs (CRECs), which are past releases of OHMs that have achieved regulatory closure with conditions; and potential for a future release of OHM. The feasibility of stormwater infiltration BMPs will be verified through a program of soil sampling and laboratory testing in order to determine specific conditions in the Project Area that influence stormwater management design.

The following sections discuss the conceptual methods for managing and treating stormwater with respect to system owner/operator for the No Build, Preferred Alternative and Throat Area Variations.

No Build

The No Build Alternative includes rehabilitation of the I-90 viaduct. The structure will include drainage inlets in the deck that connect to drain pipe supported by the bridge girders and columns. Stormwater will be conveyed by a closed pipe system to proposed infiltration trenches under the viaduct. This treated stormwater runoff flows to Pump Station No. 2, which is located at the easterly abutment of the I-90 viaduct. Space for these trenches will be constrained by the I-90 viaduct foundations, existing underground utilities, and railroad track alignments, but their configuration may be adapted to form around these obstructions. The remaining, existing, uncontrolled discharges of stormwater runoff from the MassDOT drainage system within the Project Area will continue to discharge to the Charles River with no improvements to the stormwater management system.

Under the No Build Alternative, there will be no change to the existing stormwater infrastructure and management within the Worcester Main Line ROW and rail yard. As described in Section 4.17, stormwater from the rail yard will continue to discharge to the Salt Creek Culvert and the Charles River, and the west end of the rail yard will continue to collect stormwater through swales and catch basins and drain through the I-90 drainage system to the Charles River. These systems do not meet current standards for TSS removal and peak rate reduction. Under the No Build Alternative, the Project Area will not achieve a reduction in stormwater phosphorous loadings.

MassDOT Jurisdiction: I-90 Interchange and Viaduct

For the Preferred Alternative, the concept of managing stormwater runoff will include curbs and gutters designed to collect and direct runoff to open grated catch basin inlets. The runoff will then be conveyed by a series of underground pipes to a treatment system that addresses water quality before stormwater is discharged to the Charles River, by either a point source discharge (pipe) or through the soils, into the groundwater and eventually migrating into the Charles River.

Stormwater management improvements will be constructed to achieve compliance with federal and state regulations including the U.S. EPA TMDL Program and the MassDEP Stormwater Management Standards. New collection and conveyance systems will be constructed for the proposed I-90 highway section, the exit and entrance ramps, and the viaduct. Most of the mainline and interchange drainage infrastructure will be removed or abandoned and new infrastructure will be constructed. MassDOT's preference for stormwater quality treatment is by above-ground vegetated features where ample space allows. The stormwater improvements will be designed in accordance with the *MassDOT Stormwater Handbook*.

The existing primary MassDOT stormwater discharge to the Charles River is through three 42-inch culverts that will need to be removed due to a conflict with the proposed SFR underpass. A relocated discharge pipe (or pipes), crossing south of the new SFR underpass, will be constructed and will continue to discharge to the Charles River.

Stormwater detention and recharge, and improved water quality, will be provided to the extent feasible through use of the following BMPs:

- Subsurface infiltration chambers
- Infiltration basins/swales
- Sediment forebays/isolator row
- Deep sump catch basins

MBTA Jurisdiction: MBTA Rail Operations and Worcester Main Line

Stormwater from the rail yard, including the Worcester Main Line tracks, will be managed through an underdrain system ultimately discharging into the Charles River. The future West Station will be managed by a closed drainage system, which will also ultimately discharge to the Charles River.

Stormwater management for the rail yard will be designed based on the MBTA *Commuter Rail Design Standards Manual* and will comply with MassDEP Stormwater Standards. Track drainage will follow the existing stormwater management in place for the existing tracks, which consists of a centerline crown on each track and a subdrain on either side of the tracks to collect stormwater and convey it to a closed drainage system. Stormwater from the rail yard and proposed station will be directed off-site via an existing BWSC storm drain, referred to as Salt Creek, which runs under the existing tracks and discharges into the Charles River. MassDOT will coordinate with BWSC as the design progresses to ensure compliance and alignment with BWSC design standards.

The rail yard will discharge into an existing BWSC storm drain, and therefore, will be subject to approval from the BWSC. MassDOT will work with BWSC to ensure the Project complies with the City of Boston's MS4 Permit and will not result in any new discharges specifically regulated under the Clean Water Act[1].

Stormwater detention and recharge, and improved water quality, will be provided to the extent feasible through use of the following BMPs:

- Drip pans
- Oil/water separators
- Subsurface infiltration chambers
- Porous pavement
- Deep sump catch basins

The Stormwater Management for Rail Components graphic on the following page shows the conceptual location of the infiltration chambers and the porous pavement.

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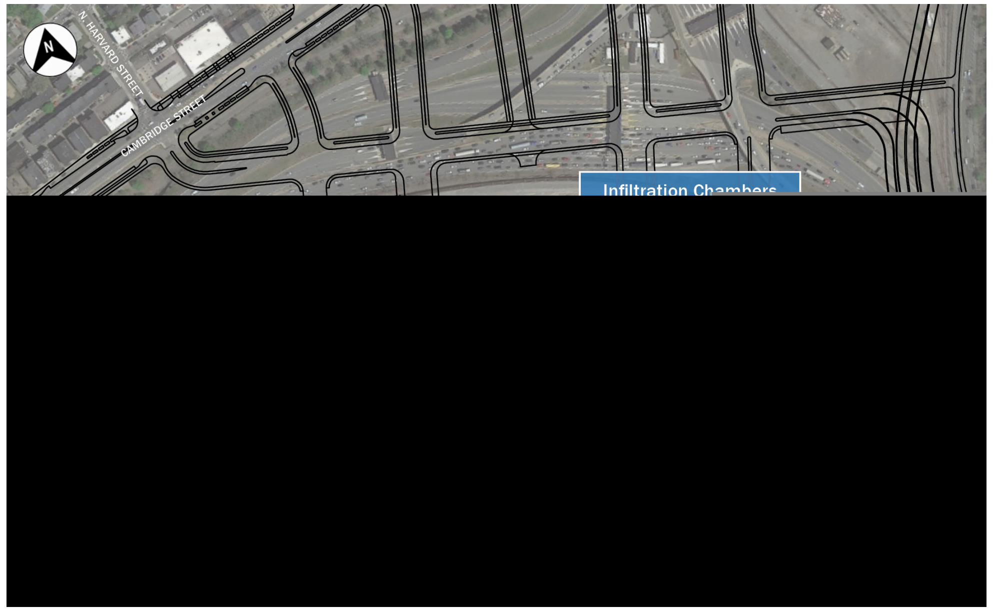
[1] Federal Water Pollution Control Act, known as the "Clean Water Act", 33 U.S.C. 1251 et seq.



Stormwater Management for Rail Components

City of Boston, Boston Water and Sewer Commission Jurisdiction: Cambridge Street and Connector Roads

New collection and conveyance systems will be installed to some extent on reconstructed Cambridge Street, and all new drainage infrastructure will be installed within the new street network. Some sections of the existing Cambridge Street drainage trunk line will be retained and some will be removed or abandoned. The existing drainage discharge pipes to the Charles River will be repaired, as needed, and retained. No new BWSC discharge pipes are proposed. New trunk lines will be sized to convey future Harvard development runoff. The proposed drainage infrastructure will provide improvements to stormwater quality by providing treatment.

Stormwater detention and recharge, and improved water quality, will be provided through use of the following BMPs:

- Subsurface infiltration chambers
- Enhanced tree trench
- Water quality units (one per chamber)
- Deep sump catch basins

DCR Jurisdiction: Soldiers Field Road

New collection and conveyance systems will be installed in the relocated SFR. Many of the existing DCR points of discharge to the Charles River will be removed. Some existing points of discharge will be retained. The system will continue to discharge to the Charles River.

Stormwater management improvements will be constructed to achieve compliance with the MassDEP Stormwater Management Standards. New collection and conveyance systems will be installed in the relocated SFR. Many of the existing DCR outfalls to the Charles River will be removed. Some existing outfalls will be retained, but in areas where no stormwater treatment exists, new BMPs will be installed upstream of most of the retained outfalls to the maximum extent practicable. The profile of SFR will be raised, where feasible, to achieve sufficient elevation differential between the Charles River and the relocated SFR pavement surface. This will also facilitate the collection and flow of stormwater by gravity into water quality swales or stormwater treatment basins in the newly created open space, which will then outlet to the Charles River.

Stormwater detention and recharge, and improved water quality, will be provided through use of the following BMPs:

- Infiltration basins/swales
- Sediment forebays (one per basin)
- Deep sump catch basins

Harvard University Jurisdiction

The areas bounded by proposed streets in the new street grid are predominantly existing transportation infrastructure where work will involve removing highway structures, including foundations to a depth of approximately two feet below finish grade, re-contouring the terrain to remove the highway embankment and grading the slopes, placing loam to a finished surface, and seeding to stabilize the surface. All areas will be left as open space with pervious surfaces at the conclusion of the Project. Precipitation falling on these open spaces will be absorbed into the soil to some extent, but at higher rates of precipitation, the runoff will be managed to avoid unwanted ponding. The details for conveying this runoff will be established in coordination with Harvard University and included in the MassDOT design-build construction contract.

Under a separate project, Harvard University will construct a new stormwater outfall to the Charles River across from the North Connector intersection with SFR. This outfall will service the portion of the watershed that previously tied into the MassDOT drainage system discharging at the three 42-inch pipe outlets; the new outfall will be installed prior to the interchange construction. Runoff from the proposed North Connector will tie into this new outfall. The new outfall will redirect runoff from approximately 45 acres of watershed area away from the MassDOT system and into the Harvard-owned system.

5.17.1.2 Best Management Practices

The following sections briefly describe each BMP and its intended use for the Project.

Infiltration basins or excavated depressions within MassDOT jurisdiction will be located adjacent to I-90 within areas unoccupied by Project components, where feasible. Basins will be sized to provide water quality treatment and recharge based on the contributing area to each. The bottom of the basins will be at least two feet above seasonal high ground water and bedrock, as required under MassDEP Stormwater Standards. The elevation of seasonal high ground water will be confirmed prior to final design to determine the viability of infiltration basin locations. In addition, the location of existing soil contamination will influence the siting of each basin to avoid activation of direct groundwater transport of contaminants through concentrated infiltration. Each basin will outlet through a control structure, enter a collector pipe and eventually discharge to the Charles River.

Within DCR jurisdiction, infiltration basins will likely be feasible only where stormwater collected at the proposed SFR underpass will be pumped to the surface. Due to the proximity of DCR land to the Charles River, the separation between the bottom of proposed infiltration basins and groundwater elevation will likely be minimal, meaning that infiltration practices will not be possible. However, where the elevation of the newly created open space is higher than the existing ground and where separation from the Charles River is greatest, infiltration basins may be feasible.

Typical Infiltration Basin

Surface infiltration swales will be located under the I-90 viaduct within MassDOT jurisdiction, where feasible, for the 3K-HV Variation. Stormwater will enter the trench at one end and be absorbed through the aggregate or stone and dispersed into the underlying soils.

Within DCR jurisdiction, infiltration swales will be most practicable in the newly created open space where the proposed surface may be increased above existing ground, thus enabling gravity flow from the SFR drainage system to discharge into the swales.

Typical Infiltration Swale

Sediment forebays are considered part of the infiltration basin/swale. They provide a deeper area at the point where the discharge pipe enters, and solids and sediment are allowed to settle out, prior to entering the main part of the infiltration basin/swale. Forebays provide pretreatment prior to discharge into a stormwater management basin and facilitate long-term maintenance. The forebays will be sized to treat 0.1 inch of runoff from the contributing area, consistent with MassDEP sizing guidelines. In addition to the total suspended solids (TSS) removal, the forebays will also provide velocity dissipation where higher flows will be reduced to minimize erosion.

Typical Sediment Forebay

Subsurface infiltration chambers within MassDOT jurisdiction will be located adjacent to I-90 where open basins are not feasible. The chambers will be sized based on the area contributing to each chamber. An isolator row will provide the required pre-treatment. The chambers will be capped for safety with access through top hatches.

Within MBTA jurisdiction, subsurface infiltration chambers will be used to store the stormwater and allow it to slowly infiltrate into the ground, naturally filtering out phosphorus in addition to other pollutants. Where infiltration chambers are used, stormwater will be collected from the impervious surfaces and ballast areas within the rail yard. It will then be directed to the infiltration chambers, located under the proposed drive aisles, through a series of pipes and underdrains.

Within BWSC jurisdiction, subsurface infiltration chambers will be located under city streets/sidewalks where open basins are not feasible. The chambers will be constructed with aggregate or stone at the bottom and sized for the amount of area contributing to each chamber. The chambers will be capped for safety with access through top hatches.

Subsurface Infiltration Chamber

Deep sump catch basins will be located in all jurisdictions along I-90, at entrance and exit ramps, along the curb lines of reconstructed Cambridge Street and the proposed street network, within the rail yard and along the relocated SFR curb lines. There will be bicycle-friendly catch basin grates on those sections of roadway where cycling will be allowed. Deep sump catch basins contribute towards water quality treatment by providing storage space below the outlet pipe where suspended solids are allowed to settle to the bottom of the structure. Any proposed catch basin within the rail yard will be equipped with a deep sump and hood to prevent any floatable debris and oil picked up in the stormwater from entering the closed drainage system. Because all runoff eventually discharges to the Charles River, BWSC has requested that the proposed drainage system include castings installed adjacent to each structure imprinted with the text “DON’T DUMP: DRAINS TO THE CHARLES RIVER.”

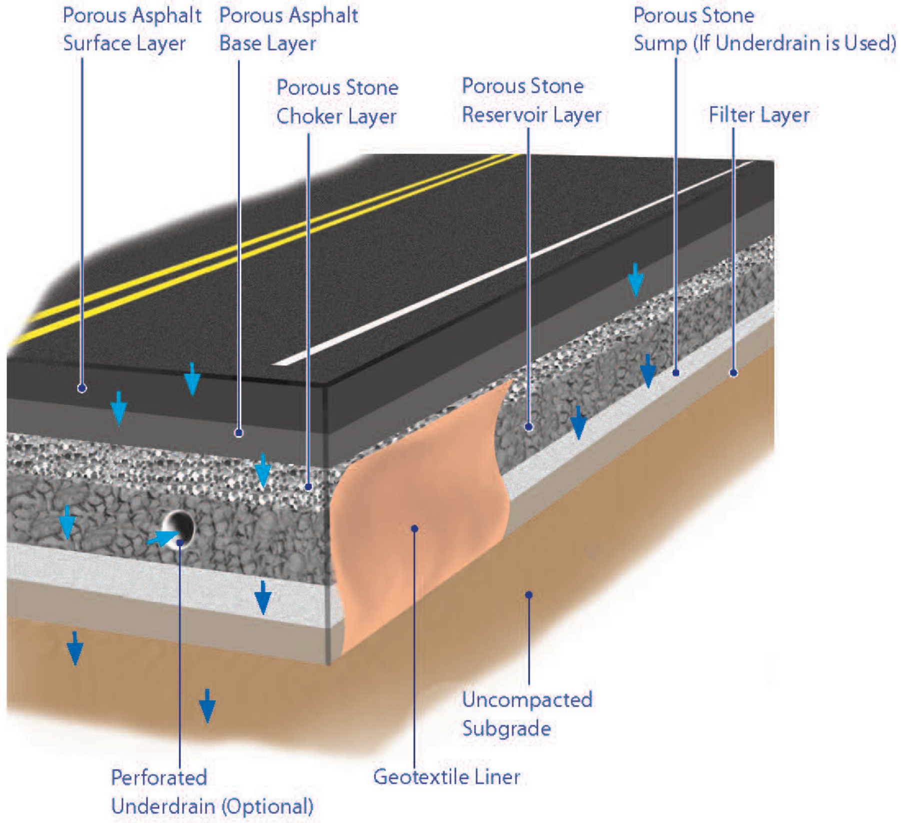
DONT DUMP
DRAINS TO
CHARLES RIVER

“Don’t Dump” Casting

Drip pans will be located within MBTA jurisdiction at each locomotive storage area to collect any potential contaminants. The drip pans will connect to an oil/water separator for pre-treatment before being connected to the closed drainage system. Where on-site fueling occurs, drip pans or fuel pads would be placed to control spills. A NPDES Multi Sector General Permit (Sector P) will be required for BPY.

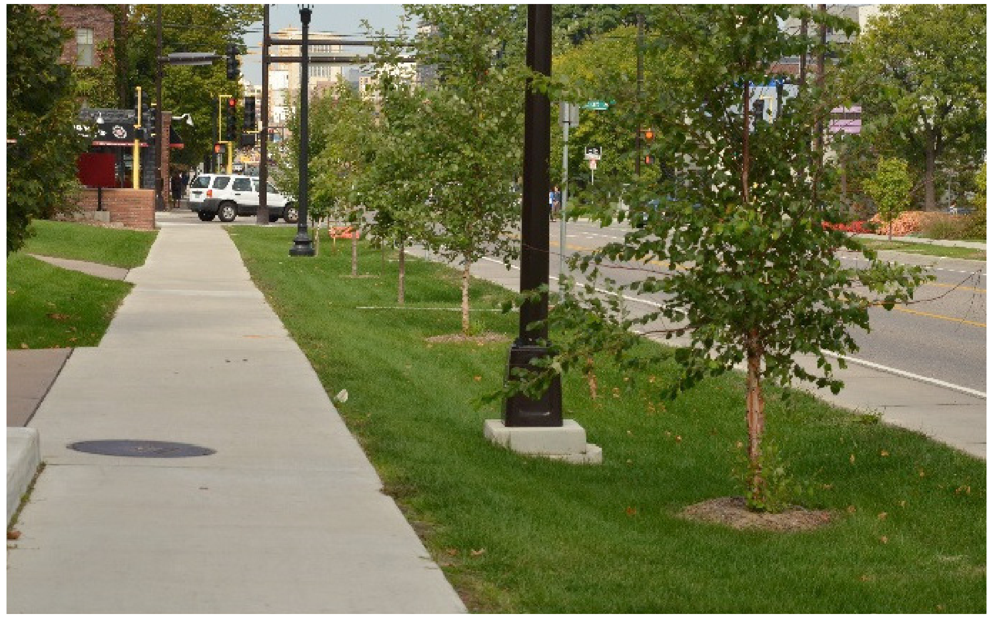
Oil/water separators (OWS) will be used at key locations within MBTA jurisdiction, including the locomotive storage areas, to collect potentially contaminated stormwater and pre-treat the water, retaining oil and floating debris.

Porous pavement (lined or unlined) will be placed within MBTA jurisdiction in the drive aisles instead of traditional pavement. Porous pavement allows stormwater to filter through the pavement into various sand and gravel layers. After moving vertically through the various media, the stormwater will be allowed to infiltrate into the ground or the system could be lined and the stormwater directed into an underdrain and to Salt Creek Culvert.


Porous Asphalt Surface Layer
Porous Asphalt Base Layer
Porous Stone Choker Layer
Porous Stone Reservoir Layer
Porous Stone Sump (If Underdrain is Used)
Filter Layer
Uncompacted Subgrade
Perforated Underdrain (Optional)
Geotextile Liner

Typical Porous Pavement Detail

Enhanced tree trenches will be located within BWSC jurisdiction in the sidewalk sections of the street grid, appropriately sited where feasible for treatment of sidewalk stormwater runoff. They will be connected to a subsurface system of stone intended to increase storage and infiltration capability.



Typical Tree Box Filter System

Water quality units will be located within BWSC jurisdiction and used to pre-treat runoff before it reaches the underground infiltration chambers.

Bioretention areas/rain gardens are presented as an alternative option for all jurisdictions. Bioretention areas can be lined to prevent recharge if needed while maintaining required treatment levels for pollutant removal. Bioretention areas are not intended to treat large drainage areas, but they can be implemented on a decentralized basis in some locations if infiltration is deemed infeasible and adequate space is available. Table 5.17-2 presents potential stormwater treatment options by feasibility within each jurisdiction.

Table 5.17-2: Water Quality Treatment Options

BMP	Entity/Jurisdiction			
	MassDOT	MBTA	BWSC	DCR
Surface Infiltration Basins/Swales	✓			✓
Sediment Forebays	✓			✓
Subsurface Infiltration Chambers	✓	✓	✓	
Deep Sump Catch Basins	✓	✓	✓	✓
Drip Pans		✓		
Oil/Water Separators		✓		
Porous Pavement		✓		
Enhanced Tree Trench			✓	
Water Quality Unit			✓	
Bioretention Area	✓	✓	✓	✓

✓ = feasible option

Throat Area Variations

For the Preferred Alternative and the three Throat Area Variations, the concept of managing stormwater runoff will essentially be the same. However, for the portions of each Throat Area Variation described as below grade or depressed, special considerations are required. Additional design and construction requirements arise when a facility is constructed below grade, with the degree of complexity and cost increasing as the depth below-grade increases. Even at shallow depths, a below grade facility introduces the need to pump stormwater collected in the roadway drainage system to a higher elevation and location for water quality treatment and subsequent discharge to an elevation at or above the Charles River water line. In addition, a below-grade design must include a system to prevent ground water from entering the interstate pavement section. Because an underdrain system installed so close to the Charles River will not work, a below-grade roadway in this location must be constructed of anti- buoyant concrete slabs and walls that will prevent groundwater intrusion. Furthermore, a below-grade facility will be subject to an increased likelihood of flooding as storm severity and frequencies increase according to climate change forecasts.

Roadway surfaces, curbs and gutters will be designed to direct runoff to catch basin inlets. The runoff is then conveyed in a series of underground pipes to a treatment system that addresses water quality before discharging it to the Charles River, by either a point source discharge (pipe) or through the soils, into the groundwater and eventually migrating into the Charles River.

Under all three Throat Area Variations, the existing MassDOT connections to the Salt Creek Culvert will be removed. Stormwater runoff from the Throat Area Variations, currently connected to Salt Creek, will be treated, if possible, and directed to a new outfall to the Charles River.

The new stormwater management infrastructure associated with the Throat Area Variations will be owned and maintained by MassDOT, DCR and the MBTA. The conceptual design for managing and treating stormwater for each alternative is described below.

3K-HV Variation

The 3K-HV Variation provides sufficient area under the highway viaduct, between viaduct columns, for the installation of stormwater BMPs. This variation will not require stormwater pumping as it will maintain space for stormwater treatment, allowing for an exceedance of the phosphorous removal rate target. 3K-AMP and 3K-ABC will require pumping of stormwater, will have constrained areas for stormwater treatment, and will not provide adequate shoulder width in the highway to safely contain stormwater flow. Because the three Throat Area Variations differ by structure type, such as viaduct versus at grade, and differ in terms of available space in which to locate the stormwater practices, the methods of achieving water quality criteria will differ for each.

The 3K-HV Variation provides the opportunity to treat stormwater runoff from the viaduct underneath the structure in an infiltration swale that will be designed around viaduct foundations and adjacent to railroad tracks. This treated stormwater runoff flows to Pump Station No. 2, located at the easterly abutment of the I-90 viaduct. The proposed street system in the watershed area that currently drains to Pump Station No. 1 will be slightly higher in elevation than the existing condition, allowing the proposed system in this area to drain by gravity. Under all three Throat Area Variations, Underground Pump Station No. 1 north of Cambridge Street will be removed.

Under the 3K-HV Variation, the highway viaduct will cover the rail tracks through the Throat Area. The rail tracks, therefore, will not receive direct rainfall and corresponding runoff. Any stormwater that does make its way to the rail tracks will infiltrate into ballast, run-on to the sub ballast layer and flow to the underdrains or perforated pipes that collect and convey stormwater. The underdrain system will flow southeast to Pump Station No. 2 and ultimately discharge into the Charles River. See Figure 5.17-5.

The 3K-HV Variation will provide sufficient shoulder width so stormwater runoff and ice hazards will not encroach into the adjacent travel lanes. There will also be an area under the viaduct for the installation of stormwater BMPs, which will help contribute to this variation's ability to exceed the targeted phosphorus load reduction of 64%. 3K-HV will achieve a calculated phosphorous load reduction of 66% with a combination of BMPs constructed outside of the Throat Area and under the viaduct.

3K-AMP Variation

A portion of the 3K-AMP Variation depresses I-90 below existing ground elevations. Consequently, the proposed drainage system will be below the water elevation of the Charles River. Stormwater will not drain by gravity flow to the river and must be pumped. Some of the runoff from the Throat Area will flow by gravity west toward a BMP, but most will flow east toward Pump Station No. 2, which will need to be relocated to construct the 3K-AMP Variation. The flows to the pump station will be minimally treated by catch basin sumps, due to lack of space for other treatment practices.

The standard for designing pavement drainage on an interstate is to prevent standing water or flooding into the travel lane and beyond the shoulder during the 10-year storm event. The 3K-AMP Variation will have 2- and 3-foot shoulders. Due to this narrow width, it is practical to assume that stormwater will extend into the travel lanes during storms and create a safety hazard.

Under the 3K-AMP Variation, the rail viaduct will cover the I-90 east-bound lanes and receive direct rainfall. The elevated rail viaduct structure will be entirely covered in ballast material, but will not have the sub-ballast layer typical for at-grade rail tracks. Instead of running on to a sub-ballast layer and flowing to the underdrain, stormwater will run on to the impervious viaduct structure and flow into subdrains. The stormwater will flow to the reconstructed Pump Station No. 2 at its new location, and ultimately discharge into the Charles River. Stormwater BMPs will not be feasible under the rail viaduct due to space restrictions caused by the configuration of SFR, the at-grade highway, and the Worcester Main Line.

The 3K-AMP Variation will achieve a calculated phosphorous load reduction of 59% with BMPs constructed outside of the Throat Area. This variation achieves a lower phosphorus load reduction than 3K-HV because there is less opportunity to treat stormwater. The targeted phosphorus load reduction of 64% will not be achieved.

3K-ABC Variation

A portion of the 3K-ABC Variation depresses I-90 below existing ground elevations. Consequently, the proposed drainage system will be below the water elevation of the Charles River. Stormwater will not drain to the river by gravity and must be pumped. Some of the runoff from the Throat Area will flow by gravity west toward a BMP, but most will flow east toward a reconstructed Pump Station No. 2, which must be relocated due to impacts created by the variation. The flows to the pump station will be minimally treated by catch basin sumps, due to lack of space for other pretreatment practices.

The standard for designing pavement drainage on an interstate is to prevent standing water or flooding into the travel lane and beyond the shoulder during the 10-year storm event. The 3K-ABC Variation will have only 2-foot shoulders. Ensuring that stormwater will not extend into the travel lanes during storms and create a safety hazard is not practical due to the narrow width.

The stormwater from the rail tracks will travel vertically through the ballast, run on the sub-ballast layer and flow into an underdrain. The underdrain system will flow southeast to the relocated Pump Station No. 2 and ultimately discharge into the Charles River. Under this variation, there will not be enough unoccupied ground area to construct stormwater BMPs due to the configuration of SFR, the highway and the rail tracks.

In terms of water quality, the 3K-ABC Variation will depress a section of I-90 such that the proposed drainage collection system will be below the water elevation of the Charles River and will require pumping. This variation will achieve a calculated phosphorous load reduction of 59% with BMPs constructed outside of the Throat Area. It will achieve a lower phosphorus load reduction than 3K-HV because there is less opportunity to treat stormwater. The targeted phosphorus load reduction of 64% will not be achieved.

Table 5.17-3 presents the phosphorus load reductions for each Throat Area Variation on a Project-wide basis, based on infiltration. Not all of the Project impervious area receives the same level of water quality treatment. There are some areas where treatment is not feasible and some areas where the proposed design strives to overcompensate as much as possible. In addition to infiltration feasibility based on underlying soil conditions, there are limitations on the amount of stormwater that can be treated based on the ability to hydraulically connect these areas to proposed BMPs. For example, the elevations of some sections of the Project are too low to connect to a BMP prior to discharging to the Charles River. See attachments to Appendix M, the Stormwater Management Technical Appendix, for detailed phosphorus load reduction calculations.

Table 5.17-3: Phosphorus Reduction

Throat Area Variation	Targeted Phosphorus Load Reduction (%)	Calculated Phosphorus Load Reduction (%)
3K-HV	64	66
3K-AMP	64	59
3K-ABC	64	59

5.17.2 Regulations and Water Quality

Federal Requirements

Total Maximum Daily Load

As discussed in Section 4.17, two TMDLs, nutrients and pathogens, apply to the segment of the Charles River where the Project will discharge stormwater. Phosphorus was identified as the primary nutrient of concern with a target reduction for phosphorus concentration in stormwater established at 64%. Bacteria and fecal-related pollution primarily associated with illicit sanitary sewer connections to the storm drain system were identified as the primary sources of pathogens in the segment of the Charles River, with some contribution from overland sheet flow carrying fecal waste from geese, gulls and pet waste. The target reduction rate for pathogens is 99.5%.

MS4 Program

As discussed in Section 4.17, the U.S. EPA regulates stormwater discharges from regulated municipal separate storm sewer systems (MS4), where the system operator must develop and implement a Stormwater Management Plan (SWMP) that contains six minimum measures and measurable goals associated with them. The various operators' MS4 EPA permits do not establish numeric effluent limitations. However, they contain practices and measures that must be employed by the permit holders to meet permit conditions. The six minimum measures include: public outreach and education; public participation/involvement; illicit discharge detection and elimination; construction site runoff control; post construction runoff control; and pollution prevention/good housekeeping. MassDOT, agency-wide, is authorized to discharge to Waters of the U.S. MassDOT's annual reporting to the U.S. EPA on stormwater management plan BMPs documents compliance with the permit.

Multi-Sector General Permit

Industrial activities, such as material handling and storage, equipment maintenance and cleaning, and storage of vehicles, can be exposed to stormwater and said activities are regulated under the U.S. EPA's NPDES Multi-Sector General Permit (MSGP). Layover facilities are included in Industrial Sector P, Land Transportation and Warehousing, and are therefore regulated under the NPDES MSGP. Layover facilities fall under the standard industrial classification (SIC) 4011 and 4013 that includes rail transportation facilities. A permit via U.S. EPA's NPDES program would be required for the layover facility sites and could include stormwater effluent limits, monitoring requirements, and other conditions related to post-construction operations at the facility.

Construction General Permit

Construction-term stormwater discharges may contain pollutants including sediment, oil, grease and construction-related waste; said discharges require coverage under the U.S. EPA's NPDES Construction General Permit for Stormwater Discharges from Construction Activities. For projects disturbing one or more acres of land where discharges enter a water of the U.S., permit coverage is required. A SWPPP, including Project-specific erosion and pollution prevention and sediment control measures, must be prepared and implemented by the contractor. The conditions of the permit require performing regular inspections and preparing inspection forms.

MassDEP State Requirements

Projects subject to the MA WPA, (discussed in Section 5.12), are required to meet the MassDEP Stormwater Standards listed at 310 CMR 10.05 of the MA WPA and also the MassDEP *Massachusetts Stormwater Handbook* (2008). The following discusses conformance with the MassDEP Stormwater Standards based on the conceptual design assumptions described in Section 1.2.

Standard 1 – No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.

One new point of discharge will be constructed to manage the runoff associated with the new street grid within BWSC jurisdiction. Stormwater from this discharge point will be treated prior to discharge to the Charles River. In addition, the discharge velocity will be dissipated with riprap aprons to a level that will not cause erosion or sedimentation into the river. All existing discharge points to be maintained will be repaired, as needed, to address concrete deterioration as well as erosion and scour, if present. The MassDOT discharge point and several DCR stormwater discharges will be relocated under the post-development condition. Where necessary to relocate an existing discharge, the relocated discharge will not be not considered a "new outfall," and the relocated discharge will thereby qualify for the same level of relief from the stormwater regulations as an existing discharge. Consequently, compliance with this standard will be achieved.

Standard 2 – Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates.

The Preferred Alternative and all three Throat Area Variation designs result in a decrease of impervious area that contributes to lowering post-development peak discharge rates. Each of the proposed stormwater management basins/chambers includes a detention level that will lower the post-development peak rate of runoff for the 2-year and 10-year 24-hour storm events. Peak runoff from the 100-year 24-hour storm event will not exacerbate downstream flooding since the Project discharges directly to the Charles River, which has a water surface elevation that is controlled by the Charles River Dam before, during and after major storm events. Detailed peak flow calculations are included in Appendix M, Stormwater Management Technical Appendix. Compliance with this standard will be achieved on a Project-wide basis.

Standard 3 – Loss of annual recharge to ground water shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices and good operation and maintenance. At a minimum, the annual recharge from the post development site shall approximate the annual recharge from the pre-development conditions based on soil type.

The Project will comply with this standard to the maximum extent practical. Detailed recharge calculations are included in Appendix M. Provided there are no limitations on infiltration, hydrologic soil type and seasonal high groundwater assumptions, the Preferred Alternative and all three Throat Area Variations will achieve a level of recharge consistent with the stormwater management standards.

Environmentally Sensitive Site Design and Low Impact Development (LID) Techniques

The Project includes transformative transportation infrastructure that will create access to formerly unusable land. It supports future land development by others, and this development will be expected to be environmentally sustainable. From a stormwater management perspective, the Project will reduce environmental impacts compared to the existing conditions by improving the quality of stormwater runoff, reducing stormwater loading directly to the Charles River through on-site infiltration, and reducing impervious cover.

The proposed MassDOT highway system stormwater quality installations include: deep sump catch basins within I-90 and all ramps to improve water quality; infiltration swales under the I-90 viaduct (for the 3K-HV Throat Area Variation) for water quality and quantity treatment of deck runoff; and infiltration basins and/or chambers (depending on the availability of ROW) for water quality and quantity treatment of highway and ramp runoff.

The proposed City of Boston street grid will provide infrastructure for public transit including buses and accommodation for pedestrians and bicyclists, which by necessity, increases the footprint of impact. However, the impacts will be minimized to the greatest practicable extent. One of the guiding principles of Boston's Complete Streets guidelines is to direct stormwater to a pervious surface whenever possible using BMPs such as rain gardens and tree trenches. The proposed City of Boston drainage system adopts an array of LID treatments. Enhanced tree trenches connected to a continuous stone filter beneath the sidewalk will be provided to allow stormwater filtration and infiltration. Landscaped grass swales for infiltration of street drainage may be situated behind proposed sidewalks, but these installations will be subject to the availability of easements granted by the owner. Infiltration chambers for street drainage will be installed within the street ROW, subject to City of Boston approval.

All existing SFR drainage outlets discharge untreated stormwater runoff directly into the Charles River. The proposed drainage system will include deep sump catch basins for water quality treatment. In addition, with the proposed SFR re-alignment to the west, several acres of new open space will become available for shared uses, including stormwater management. The elevation of the open space, in comparison with groundwater elevation close to the Charles River, challenges infiltration feasibility for deeper installations. However, surface swales and open space depressions can be constructed for stormwater quality treatment of SFR runoff during storm events when public use of the open space will be minimal. Stormwater treatment will occur only during and shortly after storm events.

The proposed I-90 alignment shift to the south maximizes future potential for environmentally sensitive site development, by others, on the newly accessible private land parcels to the north created by the Project. The I-90 highway footprint is reduced with the elimination of one travel lane in each direction, from four lanes to three, between the exit ramps and the entrance ramps. In addition, the proposed split diamond interchange configuration, with exit and entrance ramps aligned closely adjacent and parallel to I-90, minimizes the footprint of interchange impact.

Standard 4 – Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of TSS. This standard is met when:

- ***a) Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan and thereafter are implemented and maintained;***
- ***b) Structural stormwater BMPs are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and***
- ***c) Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.***

Detailed water quality volume calculations are included in Appendix M, Stormwater Management Technical Appendix.

Water Quality – Total Suspended Solids

Standard 4 of the Stormwater Management Standards requires a minimum of 80% TSS removal for "new development." The "redevelopment" portion of the Project will be required to comply with this standard to the maximum extent practicable and improve existing conditions. There are a number of practices that, when used together as a "treatment train," provide TSS removal. Provided there will be no limitations on infiltration and hydrologic soil type, depth to seasonal high groundwater, presence/absence of oil and hazardous materials, and sufficient space to construct the practice, water quality treatment will be provided to the maximum extent practical, as required by the standard. Detailed TSS removal calculations are included in Appendix M, Stormwater Management Technical Appendix.

Water Quality – Total Maximum Daily Loads

As described in Section 4.17, the Charles River Watershed Association (CRWA) has requested that the Project meet the TMDL established under Section 303(d) of the Clean Water Act for the Lower Charles River by providing a 64% reduction in Total Phosphorus. The following subsections discuss the existing phosphorus and pathogen TMDLs for the Lower Charles River and the potential impacts and stormwater BMPs for the Project.

The two TMDLs that apply to the segment of the Charles River within the Project Area are nutrients and pathogens. Phosphorus was identified as the primary nutrient of concern with a target reduction for phosphorus concentration in stormwater established at 64%. Bacteria and fecal-related pollution, primarily associated with illicit sanitary sewer connections to the storm drain system, were identified as the primary sources of pathogens in the Project Area, with some contribution from overland sheet flow carrying fecal waste from geese, gulls and pet waste. The target reduction rate for pathogens is 99.5%.

Project-wide stormwater from impervious areas will be routed through infiltration BMPs whenever possible to reduce the phosphorus load to the Charles River. Stormwater from the rail yard discharges to Salt Creek Culvert and ultimately into the Lower Charles River. The stormwater from the impervious areas within the yard would pass through BMP infrastructure to remove phosphorus before discharging to the Charles River. Most of the pervious areas on site would be ballast and gravel covers. Fertilizers would not be used on site because they are a potential phosphorus source that could reach the Charles River through pervious areas.

Source Reduction Approach to Address Pathogens

Pathogen loading in the roadway setting can be highly variable and is not considered a primary source of pathogen loading to waterbodies (CSOs, Title V systems, etc.). Therefore, structural BMPs will not be implemented specifically to reduce pathogen loads to the Charles or meet the WLA stipulated in the TMDL. However, the infiltration practices proposed in each alternative are given a 90% reduction credit in pathogen concentrations in stormwater.

Significant pathogen reduction is also achieved by implementing non-structural BMPs. BWSC, DCR and MassDOT implement non-structural BMP programs including source controls and reductions, education programs, and by eliminating illicit connections. A comprehensive source control program will be implemented Project-wide, including regular catch basin cleaning and pavement sweeping. Pets will not be allowed within the rail yard, and the bordering highway and fence system will largely keep animals out, thus reducing a potential source of pathogens. During the construction-phase of the Project, an illicit connection review (identification of unauthorized connections to the drainage system) will occur and any illicit connections found will be addressed.

As described above, stormwater from the rail yard will discharge to the Salt Creek Culvert and ultimately into the Lower Charles River. Salt Creek within the Project Area is not a combined sewer overflow (CSO) system, and therefore, connecting the site's stormwater to Salt Creek will not increase the frequency of combined sewer overflows to the Charles River. Stormwater from the rail yard will pass through BMPs on site, which will help reduce pathogen concentrations in the stormwater.

The conceptual stormwater management design relies on infiltration to provide phosphorus load reduction and pathogen reductions to the maximum extent practicable. Where infiltration will not be feasible, other BMPs will be reviewed for feasibility. Detailed phosphorus load reduction calculations are included in Stormwater Management Technical Appendix M.

Compliance to the maximum extent practical will be achieved for the Project, and consequently, compliance with this standard will be achieved.

Standard 5 – For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention, all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt and stormwater runoff, the proponent shall use the specific structural stormwater BMPs determined by the Department to be suitable for such use as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26 through 53, and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

Roadway surfaces do not qualify as “areas of higher potential pollutant loads” in accordance with the Massachusetts Stormwater Handbook. The rail yard is considered to be a land use with higher potential pollutant loads (LUHPPL). Therefore, BMPs treating rail yard runoff will be designed to treat a minimum of 1-inch water quality volume and provide the pretreatment requirement of 44% TSS removal prior to infiltration. Other BMPs will be designed to treat a minimum of 0.5-inch water quality volume. See Standard 4 for a full description of the BMPs and potential storage volumes. Full compliance with this standard will be achieved.

Standard 6 – Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such area as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area, if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A “stormwater discharge” as defined in 314 CMR 3.04(2) (a)1. or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR 4.00. Stormwater discharges to a Zone I or Zone A are prohibited, unless essential to the operation of the public water supply.

There are no existing or proposed stormwater discharges to any critical areas. Full compliance with this standard will be achieved.

Standard 7 – A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5 and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

The Project is considered redevelopment due to a decrease in impervious area under proposed conditions for the Preferred Alternative and all three Throat Area Variations; therefore, the Project must comply with the applicable standards to the maximum extent practicable and improve overall existing conditions. The MassDOT *Stormwater Handbook for Highways and Bridges* will be used as guidance for applicable and practical mitigation measures; consequently, compliance with this standard will be achieved.

Standard 8 – A plan to control construction related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation and pollution prevention plan) shall be developed and implemented.

A detailed SWPPP will be developed by the design-build contractor and implemented for this Project. Compliance with this standard will be achieved.

Standard 9 – A long-term operation and maintenance plan shall be developed and implemented to ensure that the stormwater management system functions as designed.

An operation and maintenance plan that meets MassDOT’s NPDES MS4 SWMP as BMP for Minimum Control Measure 6 will be developed based on the specific BMPs implemented throughout the Project Area. Compliance with this standard will be achieved.

Standard 10 – All illicit discharges to the stormwater management system are prohibited.

There are no known or proposed illicit discharges within the Project limits. Should any illicit discharges be identified during the course of construction, they will be reported to the Resident Engineer or MassDOT District 6 Environmental Engineer to determine the source and potential for resolution through MassDOT’s Illicit Discharge Detection and Elimination (IDDE) program. Additionally, in areas of the Project with off-site or existing municipal local drainage connections to the existing highway system, the BWSC will be alerted to conduct an IDDE investigation to determine if potential illicit discharges exist. These investigations will include, but are not limited to, the observation of outfalls for dry weather flows or evidence of surface water contamination by non-stormwater discharges. Compliance with this standard will be achieved.

5.18 Utilities

5.18.1 No Build

Highway

Under the No Build Alternative, the I-90 viaduct will be extensively rehabilitated. To conduct the rehabilitation work, the existing utilities on the viaduct, specifically the communication ducts, will need to be relocated out of the way. To minimize disruption to service and avoid multiple temporary relocations, the ducts, owned by Level 3, will be relocated to an underground alignment that is described in detail in Section 5.18.2.

The rehabilitated viaduct will meet the requirements of National Fire Protection Association (NFPA) 502, Standards for Roads, Tunnels, Bridges and Other Limited Access Highways, which requires a standpipe fire protection system having access hose connections on both the eastbound and westbound parapets.

Lighting on the rehabilitated viaduct will be replaced with updated equipment.

Rail Operations and West Station

Under the No Build Alternative, existing utilities within the rail yard and Worcester Main Line will remain in place and will not be affected.

5.18.2 I-90 Urban Interchange Preferred Alternative

For the Preferred Alternative and Throat Area Variations, the various utilities within the Project Area will be removed, relocated, terminated or retained in place as necessary to facilitate construction. The existing utilities discussed in Chapter 4.18 will be removed and terminated at Cambridge Street when the Project is constructed. New utility infrastructure to service the Project will be installed within the new highway and street system. However, several large water and sewer mains that currently traverse the Project Area will remain in their existing locations. These facilities are located within permanent easements and are owned by either the MWRA or BWSC.

Highway and Streets

Telecommunications

An existing telecommunication system traversing the Project Area will be retained, but rerouted. Another telecommunication system, owned by Sprint, traverses the Project in an underground alignment that closely follows the existing commuter rail tracks. The Sprint system will also be retained in the same general location, with rerouting expected to be relatively minor to accommodate proposed track work in some locations.

Service Line Impacts

Existing utility lines that serviced former I-90 toll support buildings and other areas within the existing interchange will be abandoned and terminated at Cambridge Street when the Project is constructed. New utility infrastructure to service the Project will be installed within the new MassDOT highway layout, City of Boston street system, DCR’s SFR layout, or the MBTA’s ROW.

Trunk Line Impacts

Several large water and sewer mains that currently traverse the Project Area outside the proposed highway and street system, on private land, will remain in their existing locations. These facilities are located within permanent easements and are owned by either the MWRA or BWSC.

Proposed Viaduct Impacts

The proposed I-90 viaduct foundations and existing viaduct foundation modifications will require spanning over some sections of the existing 58-inch by 63-inch MWRA sewer, some of which is pile-supported. Proposed viaduct foundations further to the west will be situated to avoid impacting the existing 32-inch by 48-inch brick sewer and the existing BWSC 7-foot by 7-foot Salt Creek Culvert.

The MWRA’s existing 64-inch water main crossing under the I-90 viaduct from Buick Street to the Charles River is encased within an 84-inch steel sleeve where the line crosses under railroad track. Because the Project requires relocation of railroad track over the water main, both to permanent and temporary alignments, additional steel casing or similar load shielding will need to be installed.

The existing Level 3 fiber optic cables that are currently supported within four 8-inch conduits on the I-90 viaduct will be relocated to new underground steel conduits, beginning in the vicinity of the existing southerly abutment of the viaduct and ending at a connection with the existing underground cables west of the Cambridge Street bridge. The alignment of the relocated communication system will follow the alignment of the proposed I-90 viaduct, then curve to the west to follow an alignment parallel to the proposed MBTA commuter rail track alignments through BPY. The system will bend to the north at the Cambridge Street bridge, transitioning to bridge-supported conduits over I-90, then transition back to an underground alignment at the northerly bridge abutment, and finally run west to connect with the existing system west of the bridge.

The communication providers supported by the system (Level 3, Verizon Business, AT&T, Williams Communication Group and MassDOT), will require uninterrupted service throughout construction. Consequently, the installation of the relocated system must be completed before demolition of the viaduct superstructure and must be coordinated with construction of proposed viaduct foundations. The existing Sprint communication conduit that runs approximately along the existing MBTA commuter rail alignment will be retained in its existing location.

AET Impacts

The All Electronic Tolling (AET) truss over I-90, west of the Commonwealth Avenue Bridge, will be impacted by the Project and will require relocation in the same approximate area. In addition, the electrical power and communication facilities supporting the existing installation will also need to be relocated out of the way of the Project. To maintain continuing service during construction, a new support truss with all new equipment and supporting utility infrastructure will be installed while the existing truss remains operational.

Proposed SFR Impacts

The westerly limit of the proposed SFR re-alignment and the location of the proposed SFR underpass are designed to avoid impacting MWRA's adjacent, existing 42-inch overflow sewer while also providing as much open space as possible bordering the Charles River.

The proposed SFR underpass cannot drain stormwater with a gravity system. Stormwater within the area drained at the underpass will be conveyed to a proposed stormwater pump station that will pump stormwater to an open area for treatment east of SFR. Electrical power, communication and water service lines will be installed to support the pump station.

Proposed Pedestrian Bridge Impacts

Impacts to the existing utilities in Franklin Street and within the former Franklin Street ROW will be avoided by constructing the proposed pedestrian bridge replacement outside of the area of the utility corridor. Because the existing Cambridge Street Bridge has the capacity to support additional utilities in empty bays, relocating the electrical duct on the pedestrian bridge to the Cambridge Street Bridge is preferred and will be evaluated with the utility company during preliminary design.

Proposed North-South Pedestrian and Bicycle Connector Impacts

The foundations for the proposed Malvern Street bicycle and pedestrian connector will impact the existing sewer and drain lines that run through the property at 76 Ashford Street, requiring relocation within new or expanded easements.

Proposed Viaduct Utility Requirements

In accordance with NFPA 502, Standards for Roads, Tunnels, Bridges and Other Limited Access Highways, the proposed I-90 viaduct will require a standpipe fire protection system with access hose connections on both the eastbound and westbound parapets. Due to winter freezing conditions, a dry standpipe system is proposed, conforming to NFPA code requirements. An active BWSC water main sized to service the system will be installed beneath the viaduct for its entire length, servicing fire needs for the areas below the viaduct and hydrant connections for the standpipe system.

Proposed Street and Highway Utility Infrastructure

BWSC water mains appropriately sized by the land owner in coordination with BWSC to service the Project's developable parcels in the future will be installed. Fire hydrants spaced in accordance with City of Boston Fire Department requirements will be constructed along the proposed streets.

BWSC sanitary sewer pipes appropriately sized by the land owner in coordination with BWSC to service the Project's developable parcels in the future may be installed at the discretion of the land owner in coordination with the Project, but the pipes, if installed, will not be connected to the existing sewer mains in Cambridge Street. The proposed highway and street components of the Project do not require sewer infrastructure.

Empty electrical power conduit will be installed in the street grid area of the Project for servicing future development at the discretion of the land owner in coordination with the Project. Similarly, empty communication conduit and inactive gas lines may also be installed at the discretion of the land owner.

An electrical power conduit system and load centers for the proposed highway, viaduct and street lighting systems will be installed throughout the Project. Temporary lighting will be needed during construction.

Highway lighting conforming to the *FHWA Lighting Handbook* (2012 or latest edition) will be constructed on I-90 along both the at-grade section and the viaduct. Street lighting conforming to City of Boston street and pedestrian illumination levels will be constructed on the proposed street grid and along SFR. New pedestrian lighting will be installed along the PDW Path. In addition, lighting will be installed on the proposed SFR underpass structure.

MWRA 8(m) Permit

The proposed Project work traverses several existing water and sewer easements owned by MWRA. In accordance with Section 8(m) of Chapter 372 of the Acts of 1984, MassDOT will be required to obtain a permit from MWRA for the protection of existing water supply infrastructure. As noted previously, the Project will install protective infrastructure where new railroad track crosses the 64-inch water main under the I-90 viaduct. In addition, the permit application will describe that the Project will have no impact on the MWRA's City Tunnel Extension. The tunnel crosses the Project approximately 300 feet underground on a southwest-to-northeast alignment at the Cambridge Street Bridge, with the tunnel situated predominantly north of Cambridge Street and out of the Project work area.

Rail Operations and West Station

Potable Water

MBTA facilities will require delivery of potable water to serve the layover yard and West Station. In addition, it is anticipated that a new or rebuilt water line will need to be run to Pump Station No. 2. Water service will be derived from BWSC mains located in the Project vicinity. Water service will be obtained by tapping existing water mains located below Cambridge Street, Babcock Street or Buick Street, and likely from more than one location to create a loop system within the yard and a redundant supply. Water pipes may also be placed below the new interchange roadways and on bridges in anticipation of future air rights development. Within the rail yard, water will be distributed to crew facilities, layover train berths and West Station. Water use at crew facilities will be domestic (consumption and personal care) and for fire suppression. Water will be delivered to train berths to refill domestic water tanks located on the cars as well as to serve janitorial needs. Likewise, water service at West Station will serve fire suppression, janitorial and domestic needs. In addition, a new water main and hydrants will be placed within the Throat Area to serve fire suppression needs.

The rail yard is anticipated to consume less water than was originally estimated in the ENF for the 2040 Design Year since the Project no longer includes a car wash, pit track, or wheel truing facility as part of the rail yard. MassDOT estimates that the rail yard will consume approximately 3.9 million gallons of water annually (10,800 gallons per day) in the 2025 Opening Year, and approximately 2 million gallons of water annually (5,600 gallons per day) in the 2040 Design Year. Water consumption would be driven primarily by water resupply to train coaches during layover for lavatories and to support air conditioning, and by water consumption in the crew quarters. The rail yard is expected to consume more water in the 2025 Opening Year than the 2040 Design Year because the rail yard would have storage space for up to 16 train sets in the 2025 Opening Year versus eight train sets in the 2040 Design Year. Tables 5.18-1 and 5.18-2 summarize the rail yard water consumption for the 2025 Opening Year and 2040 Opening Year, respectively.

Table 5.18-1: Rail Yard Water Consumption, 2025 Opening Year

Source	2025 Estimated Consumption (gallons per day based on 16 train set layover)	2025 Estimated Consumption (gallons annually, 5 days per week)	2025 Estimated Consumption (average gallons/day)
Coach Lavatories and Air Conditioning Tanks	14,400.00	3,754,285.71	10,285.71
Crew Quarters (15 staff, est 50 gallons/day)	750.00	195,535.71	535.71
Total	**15,150.00**	**3,949,821.42**	**10,821.42**

Table 5.18-2: Rail Yard Water Consumption, 2040 Opening Year

Source	2040 Estimated Consumption (gallons per day based on 16 train set layover)	2040 Estimated Consumption (gallons annually, 5 days per week)	2040 Estimated Consumption (average gallons/day)
Coach Lavatories and Air Conditioning Tanks	7,200.00	1,877,142.86	5,142.86
Crew Quarters (15 staff, est 50 gallons/day)	750.00	195,535.71	535.71
Total	**7,950.00**	**2,072,678.57**	**5,678.57**

Water would be resupplied to train coaches during layover. Water is used for lavatories and to support air conditioning. Coach tank capacity is about 500 gallons (conservative), but the coaches are not likely to need complete filling (assumed 75% of total capacity would need to be filled, and that the AC is only needed 30% of the year).

Sanitary Sewer

Sewer connections will be required to collect sanitary discharges from both the yard and station facilities. The West Station and layover yard areas are currently served by an existing BWSC brick sewer (36 feet by 38 feet) that lies within an easement that runs along the southern property line from Cambridge Street to Babcock Street. The Project will create new sanitary pipes internal to the railroad yard that will collect discharges from the crew quarters and West Station. The Preferred Alternative will also provide points along the layover train tracks where sanitary discharges will be pumped from the train lavatory tanks into the sewer.

The rail yard is anticipated to discharge 250,000 gallons of wastewater annually (660 average gallons per day) in both the 2025 Opening Year and 2040 Design Year. Wastewater discharge would originate primarily from the rail yard crew quarters. The estimated wastewater generation assumes a crew size of approximately 15 employees per weekday with a wastewater generation rate of approximately 35 gallons per employee per day, approximately ten administrative staff at the crew quarters with a wastewater generation rate of 20 gallons per day, and ten visitors per weekday with a wastewater generation rate of approximately 20 gallons per visitor per day.

Consistent with MBTA standard maintenance practices for daytime layover, wastewater from train lavatories would be pumped from train coaches into transport trucks and would not be disposed of at the rail yard through the BWSC connection. Table 5.18-3 summarizes the rail yard waste generation.

Table 5.18-3: Rail Yard Wastewater Generation

Source	Personnel	Estimated Generation Rate (gallons/day/person)	Wastewater Estimate (gallons/day)	Wastewater Estimate (gallons annually, 5 days per week)	Wastewater Estimate (average gallons/day)
MBTA Staff	15	35	525	136,875	375
Administrative Staff	10	20	200	52,143	143
Visitors	10	20	200	52,143	143
Total	**35**		**925**	**241,161**	**661**

Natural Gas

The Preferred Alternative will deliver gas service into the rail yard from a point below Cambridge Street. Gas will be delivered to crew facilities for domestic hot water and other domestic uses. It is anticipated that compressed air will be generated to power a compressed air station within the yard.

Compressed Air

The Project includes the production of compressed air within the rail yard to recharge train cars during layover.

Power

The railroad facilities will derive electric power from the Eversource Lincoln Street substation via two 13.8 kV lines in a new ductbank that would travel east on Lincoln Street, turn south onto Mayflower Street, and then under I-90. These lines will feed a double-end primary switchgear line-up with four 13.8 kV feeders, which will supply two (480 V) secondary unit double-ended substations located in separate buildings on the north side of the rail yard. The facility load, estimated to be between 11 MVA and 13 MVA, includes support buildings and equipment, wayside power, switch heaters, CP-4 signals, site lighting, and station power and lighting. Equipment east of the yard (heaters, signals (CP-3), and pumping station) will be supplied by a separate 480 V utility service in proximity to those loads.

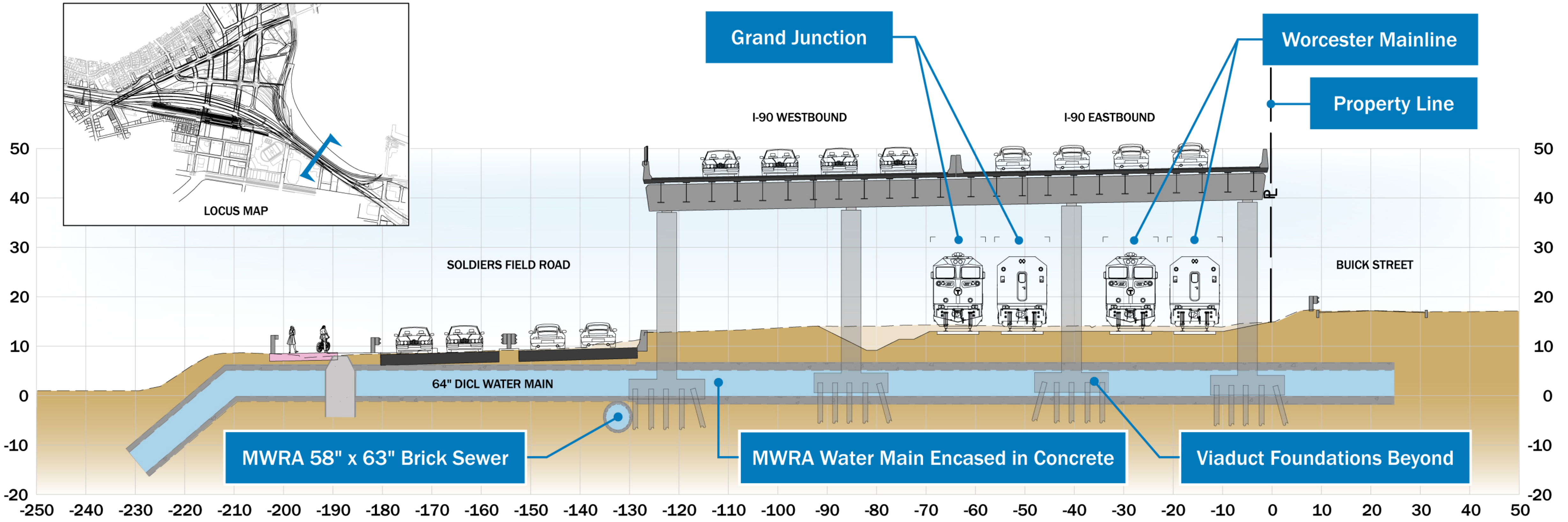
Telephone/Communications

Underground communications conduit will be placed within the yard to serve crew facilities and West Station for phone and fire alarm connections. This service will be connected to existing telecommunications infrastructure within the yard area.

5.18.3 Throat Area Variations

3K-HV

A 64-inch diameter ductile iron water main, owned and operated by the MWRA, laterally bisects the ROW in the Throat Area approximately 8 feet below existing grade. Under the 3K-HV Variation, the design of the railroad will reduce the ground cover over this water main by approximately 3 feet, but will not require relocating the main. See Graphic 5.18-1. The major water and sewer utilities in the 3K-HV Variation are shown in Figure 5.18-1.

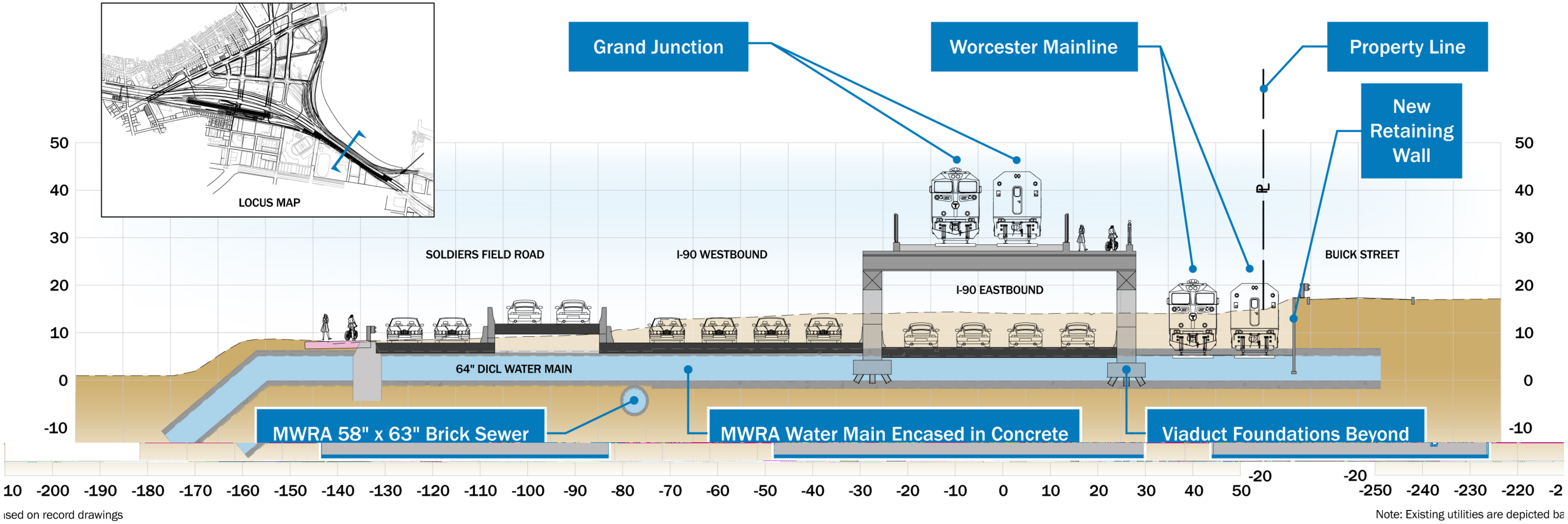

LOCUS MAP
Grand Junction
Worcester Mainline
Property Line
I-90 WESTBOUND
I-90 EASTBOUND
SOLDIERS FIELD ROAD
BUICK STREET
64" DICL WATER MAIN
MWRA 58" x 63" Brick Sewer
MWRA Water Main Encased in Concrete
Viaduct Foundations Beyond
50
40
30
20
10
0
-10
-20
-250
-240
-230
-220
-210
-200
-190
-180
-170
-160
-150
-140
-130
-120
-110
-100
-90
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50

Note: Existing utilities are depicted based on record drawings

Graphic 5.18-1: 3K-HV MWRA Throat Area Cross Section

3K-AMP

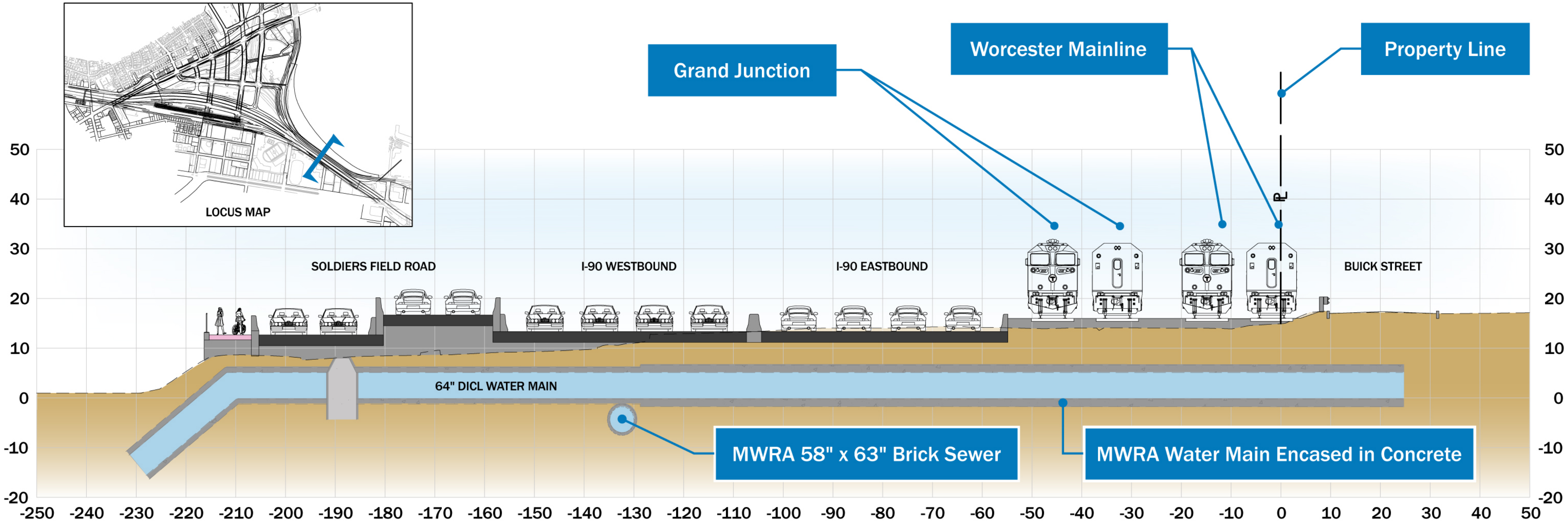
A 64-inch diameter ductile iron water main, owned and operated by the MWRA, laterally bisects the ROW in the Throat Area approximately 8 feet below existing grade. Under the 3K-AMP Variation, the design of the railroad will conflict with the water main and require relocating the main. See Graphic 5.18-2. The major water and sewer utilities in the 3K-AMP Variation are shown on Figure 5.18-2.


LOCUS MAP
Grand Junction
Worcester Mainline
Property Line
New Retaining Wall
SOLDIERS FIELD ROAD
I-90 WESTBOUND
I-90 EASTBOUND
BUICK STREET
64" DICL WATER MAIN
MWRA 58" x 63" Brick Sewer
MWRA Water Main Encased in Concrete
Viaduct Foundations Beyond
50
40
30
20
10
0
-10
-20
10 -200 -190 -180 -170 -160 -150 -140 -130 -120 -110 -100 -90 -80 -70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50
-250 -240 -230 -220 -2
ised on record drawings
Note: Existing utilities are depicted ba

Graphic 5.18-2: 3K-AMP MWRA Throat Area Cross Section

3K-ABC

A 64-inch diameter ductile iron water main, owned and operated by the MWRA, laterally bisects the ROW in the Throat Area approximately 8 feet below existing grade. Under the 3K-ABC Variation, the design of the railroad will not reduce the ground cover over this water main and will not require relocating the main. See Graphic 5.18-3. The major water and sewer utilities in the 3K-ABC Variation are shown in Figure 5.18-3.


LOCUS MAP
Grand Junction
Worcester Mainline
Property Line
℄
SOLDIERS FIELD ROAD
I-90 WESTBOUND
I-90 EASTBOUND
BUICK STREET
64" DICL WATER MAIN
MWRA 58" x 63" Brick Sewer
MWRA Water Main Encased in Concrete
50
40
30
20
10
0
-10
-20
-250
-240
-230
-220
-210
-200
-190
-180
-170
-160
-150
-140
-130
-120
-110
-100
-90
-80
-70
-60
-50
-40
-30
-20
-10
0
10
20
30
40
50

Note: Existing utilities are depicted based on record drawings

Graphic 5.18-3: 3K-ABC MWRA Throat Area Cross Section

5.19 Climate Change

The climate of a region or city is its typical or average weather, and climate change is a change in this typical or average weather. This could be a change in a region's average annual rainfall or it could be a change in a city's average temperature for a given month or season. Global climate change is a change in Earth's overall climate. This could be a rise in the average surface temperatures on Earth, also referred to as global warming, or it could be a change in the Earth's typical precipitation patterns.

Climate-related hazards are predicted to pose increasing threats to the viability and resiliency of infrastructure. The National Climate Assessment (Horton et al., 2014) specifies sea level rise, coastal flooding and intense precipitation events as the primary climate stressors for infrastructure in the Northeast. As global temperatures rise, thermal expansion and melting polar ice will contribute to eustatic sea level rise (compounded by local isostatic change). Eustatic sea level changes occur on an oceanic to worldwide scale. They result from either a change in the volume of seawater, or a change in the size of the ocean basin that contains it.

Isostatic sea level change is the result of an increase or decrease in the height of the land. When the height of the land increases, the sea level falls and when the height of the land decreases the sea level rises. Isostatic change is a local sea level change whereas eustatic change is a global sea level change. Tropical and extra-tropical storms will become more frequent and more intense, and extreme precipitation will become more common as a result of climate change. Tropical storms are low-pressure systems with activity like thunder and lightning that develop in the tropics or subtropics. Stronger tropical systems are called "hurricanes" or "typhoons," depending on where they form. Weaker tropical cyclones might be called "tropical depressions" or "tropical storms." Extratropical storms, such as Nor'easters and blizzards, have cold air at their core and derive their energy from the release of potential energy when cold and warm air masses interact.

These potential climate related impacts are highly relevant to Boston, and specifically to the Project, which lies directly adjacent to the Charles River. Therefore, the focus of this climate change vulnerability assessment is the potential exposure of the Project Area to flooding due to the changing climate conditions. This section focuses on the potential vulnerability to changing climate conditions of the Preferred Alternative and three Throat Area Variations along the Charles River.

The National Climate Assessment (Horton et al., 2014) also projects that as global temperatures rise, the frequency, intensity, and duration of heat waves will increase. In the urban context, and especially in transportation corridors such as the proposed Project Area, rising temperatures and heat waves compound the urban heat island effect. The term "heat island" describes built up areas that are hotter than nearby rural areas. This climate change vulnerability assessment also addresses the potential contribution of paved surfaces in the Project Area to the urban heat island effect, under each of the three proposed actions.

5.19.1 Modeling Climate Induced Inundation

Following Hurricane Sandy, MassDOT had growing concerns related to sea level rise and extreme storm events impacting the greater Boston transportation network. In 2015, MassDOT, in concert with the FHWA, completed a comprehensive Pilot Project assessing impacts due to sea level rise and extreme storm events within the vicinity of the Boston Harbor: Climate Change and Extreme Weather Vulnerability Assessments and Adaptation Options for the Central Artery (Bosma et al., 2015). For this Project, MassDOT developed a high resolution hydrodynamic model to assess exposure of the Central Artery/Tunnel Project (CA/T) to sea level rise (SLR) and extreme storm events under a range of climate scenarios. A hydrodynamic model is a tool used to describe or represent in some way the motion of water. The sophisticated model included the river networks (Neponset, Charles, Mystic) in the Boston area and the interaction of sea level rise, storm surge, river discharge and dam operations. This includes detailed information at the Project site. As such, the analysis presented herein relies on the MassDOT hydrodynamic model and those results, which represent the latest and most comprehensive assessment of future flood risk for the area.

The Boston Harbor Flood Risk Model (BH-FRM) is a hydrodynamic model based on mathematical representations of the processes that affect coastal water levels such as riverine flows, tides, waves, winds, storm surge, sea level rise and wave set-up, which features a fine enough resolution to identify site-specific locations that may require adaptation alternatives. BH-FRM tightly couples the ADvanced CIRCulation model's (ADCIRC) predictions of storm surge inundation with the unstructured version of Simulating WAves Nearshore (UNSWAN) model's prediction of storm-induced waves. Complete details on the MassDOT/FHWA project and the model itself are presented in Bosma et al. (2015).

A key aspect of potential flooding in Boston includes the influence of the Charles River flowing through the city and discharging into Boston Harbor. The Charles River was included in the model to evaluate the combined impact of watershed discharge and storm surge based flooding. BH-FRM also simulates flow conditions under storm scenarios (dam closure and pumping) at the New Charles River Dam. A hydrograph is a graph of the flow in a stream over a period of time. River discharge hydrographs for present and future climate conditions are integrated in the model, allowing for the assessment of pumping operations in managing upstream water levels. In all storm cases for all year scenarios, BH-FRM applies a 100-year, 24-hour discharge hydrograph to the Charles River and conservatively aligns this discharge with the peak storm surge.

BH-FRM utilizes present day and projected return period rainfall event precipitation totals (e.g. 100-year, 24-hour rainfall event for 2030), developed by Kleinfelder (2014) for the City of Cambridge's climate change vulnerability assessment, to develop river discharge hydrographs using watershed and river modeling for present day and future climate change conditions. The Charles River discharge data were provided by MWH Global (2014) and included all contributors combined (Cambridge, MWRA overflows south and north of the Charles, Watertown and Newton) to arrive at the peak flows and discharge hydrographs.

It is important to consider that, although BH-FRM accounts for increased Charles River discharge due to climate induced increases in precipitation and overbank flooding, the model does not include precipitation based flooding in the Study Area from upland sources (i.e. stormwater runoff). In other words, BH-FRM does not include potential backups in piped infrastructure, or poor drainage conditions at a specific site. Since precipitation is projected to increase with climate change, these stormwater flooding impacts are also expected to intensify.

As articulated in the model, the New Charles River Dam is managed to maintain the upstream basin between elevations of 106.5 and 108.5 feet (Metropolitan District Commission [MDC] Datum equals 0.05 to 2.05 NAVD88 datum), so the pumps are generally activated to maintain these levels. There are a total of six pumps. Practically, three pumps are activated when the operator perceives the water level will exceed elevation 108 (MDC Datum= 1.55 NAVD88), and all six can be activated as needed per the operational guidance. Each pump has a capacity of 1,400 cubic feet per second (cfs). When a storm is in the forecast, pumps also are activated to proactively reduce the water level in the river to accommodate increased discharge stormwaters.

Along with the increased discharge conditions, the BH-FRM model also includes projected sea level rise and dynamic storm surge conditions in Boston Harbor. Currently, the BH-FRM model brackets SLR scenarios for three distinct time periods (Present, 2030, 2070) and makes adjustments for local subsidence. For coastal storms, BH-FRM utilizes a Monte Carlo statistical approach, based on large sets of historical and synthetic water levels from hurricanes and Nor'easters, to estimate the composite (SLR, storm surge, river discharge) probability of flooding throughout the Boston Harbor region. The composite probability of flooding is the chance that a given location in the model will be inundated at least once in any given year under the assumed climate scenario. These inundation probabilities allow asset managers and planners to incorporate risk tolerance into vulnerability assessments, and develop appropriate and strategic adaptation interventions.

For this Project, MassDOT's risk tolerance is set to the 1% event. In other words, over the design life of the proposed I-90 Allston Interchange, the project and its related infrastructure should not be vulnerable to climate-induced inundation up to and including the 1% probability event in 2070 (the 100-year return period storm surge and river discharge combined with projected SLR for 2070).

5.19.2 Inundation Vulnerability – Present and 2030

The BH-FRM results for Present Day conditions predict no chance of flooding in the Project Area outside of the banks of the Charles River. This finding is consistent with current FEMA analyses, which concluded that the current 100-year flood discharge can be accommodated by the New Charles River Dam pumping operations such that the water surface elevation will not crest the banks of the Charles River apart from a small (850 ft long, 75 ft wide) segment of SFR, SFR northbound off-ramp, and the PDW Path in the northern portion of the Project Area, which is mapped as a 0.2% Annual Chance of Flooding (X zone) under current conditions.

Based on review of LiDAR, this is a known low elevation area along SFR. This area would become part of the open space area along SFR in all three Throat Area Variations, thus any of the proposed variations in this area would eliminate the potential for flooding of the roadway.

The BH-FRM results for 2030 conditions also predict no chance of flooding in the Project Area outside of the banks of the Charles River. BH-FRM results indicate that, unless the dams are flanked or overtopped (or otherwise rendered non-functional), the existing pump systems are able to adequately handle expected increases in river discharge due to climate change conditions. The model uses a projected 2030 peak flow of up to 3,027 cfs to represent near term future rainfall discharge flow for the Charles River (the 100-year, 24-hour peak flow is 2,615 cfs). Since these peak flows do not exceed the pumping capacity of the New Charles River Dam (8,400 cfs), no flooding is expected to occur above the dam.

Therefore, based on the available data and modeling, no impacts from current or near-term future (2030) storm surge inundation are expected for any of the three Throat Area Variations. This determination does not include precipitation based flooding in the Study Area from upland sources (i.e. stormwater runoff).

5.19.3 Inundation Vulnerability – 2070

Predicted storm surge inundation from Boston Harbor in the BH-FRM 2070 scenario flanks and overtops the New Charles River Dam, rendering the dam's pumps ineffective at removing the combined storm surge volume and Charles River discharge from the basin out to the harbor. The model uses a projected 2070 peak flow of up to 2,869 cfs to represent long term future rainfall discharge flow for the Charles River. Although these peak flows do not exceed the pumping capacity of the New Charles River Dam (8,400 cfs), storm surge induced flanking and overtopping of the dam far exceeds the capacity of the pumps and causes water to flow upstream behind the dam throughout the Charles River system.

While model results are projected in BH-FRM for 2070, flanking and overtopping of the New Charles River Dam, and subsequent upstream flooding, may occur prior to 2070. Interpolation of model results predicts that at the 0.2% risk level (500-year flood level), coastal storm surge can flank the dam by 2045 and overtop the dam by 2050. The analysis also predicts that at the 1% risk level (100-year flood level), coastal storm surge can flank the dam by 2055 and overtop the dam by 2065.

Any of the proposed actions will result in changes to road surface elevations as well as to the grading of the land in the Project Area. Final grading plans were not available for the proposed actions at the time of this analysis, so it was not possible to run BH-FRM with new topographic and frictional information. Therefore the assessment of vulnerability to climate change impacts proceeded with the parallel review of:

- Proposed road surface elevations extracted from the design documents;
- Existing LiDAR data;
- Plan-view and cross-sectional diagrams for the proposed project elements; and
- BH-FRM combined flood exceedance probability curves for the Charles River in 2070 (specifically the 2070 1% and 0.1% water surface elevations).

Potential future flooding of proposed roadway segments and land in the Project Area was evaluated by comparing 2070 1% and 0.1% water surface elevations extracted from BH-FRM to proposed road surface elevations and the existing topography, with due consideration to the condition of all proposed segments (i.e. whether roadway segments in the proposed actions have been designed as at-grade, fill, bridge, or underpass). Table 5.19-1 summarizes the water surface elevations for the 2070 combined flood exceedance probability curve for the Charles River used in this analysis. Figures 5.19-1, 5.19-2 and 5.19-3 present the Climate Change Baseline Stations for Variations 3K-HV, 3K-AMP and 3K-ABC, respectively.

Table 5.19-1 - Water Surface Elevations 2070

Exceedance Probability (%)	Water Surface Elevation (ft NAVD88)
0.1	11.1
0.2	11
0.5	8.7
1	6.3
2	5.5
5	4.3
10	4
20	4
25	3.9
30	3.9
50	3.5
100	2.5

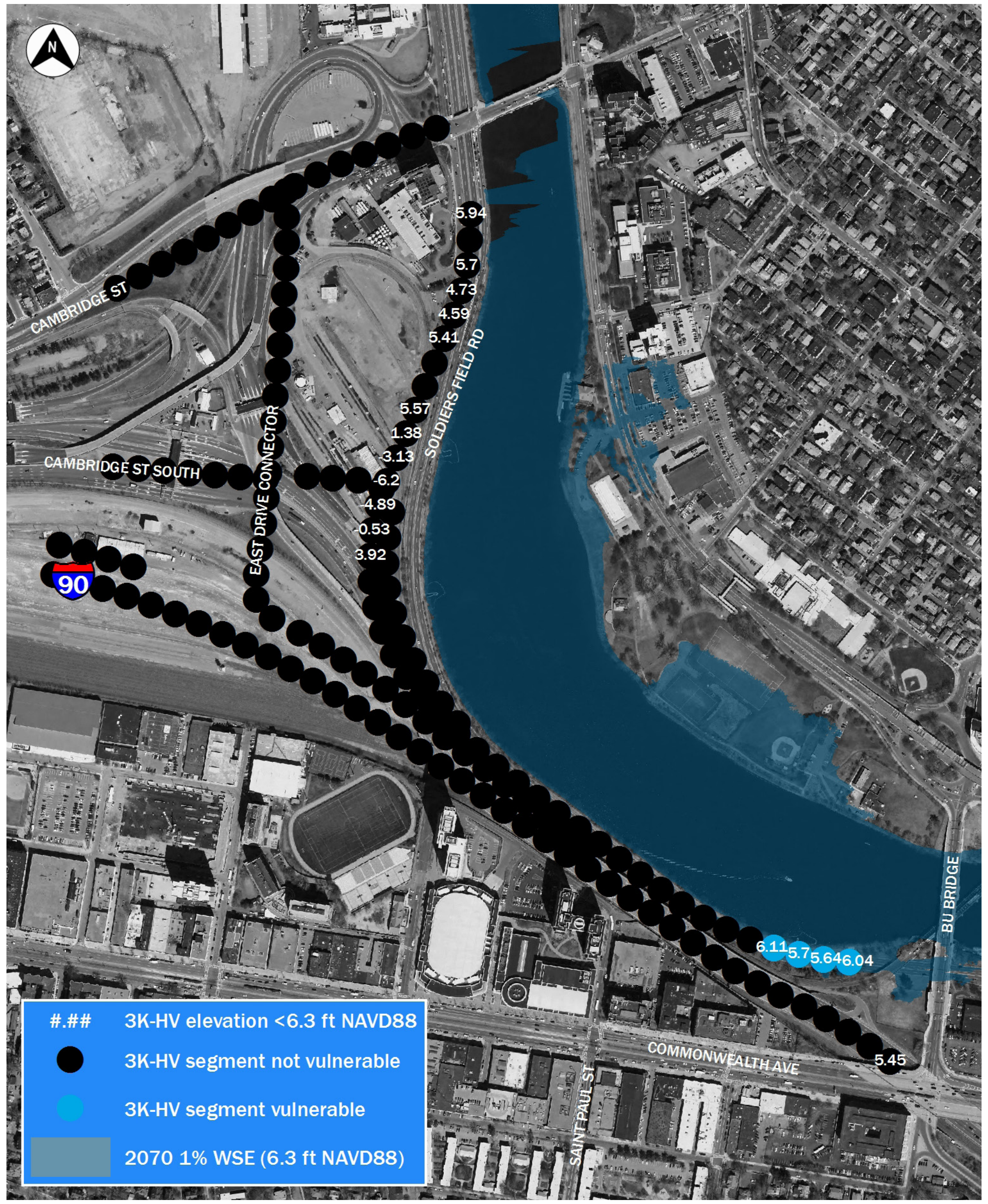
The 2070 1% (100-year event) water surface elevation used in this analysis is 6.3 ft NAVD88. The 2070 0.1% (1000-year event) water surface elevation used in this analysis is 11.1 ft NAVD88.

3K-HV

At the 1% probability level, Concept 3K-HV is vulnerable to 2070 flooding only along the at-grade southeastern portion of SFR near the BU Bridge (SFR 0+00 to SFR 3+00). All other portions of this proposed action are either planned at elevations above 6.3 ft NAVD88, or protected from inundation by existing topographic features. Graphic 5.19-1 presents the Concept 3K-HV exposure to 1% probability inundation in 2070.

At the 0.1% probability level, Concept 3K-HV is vulnerable to 2070 flooding along:

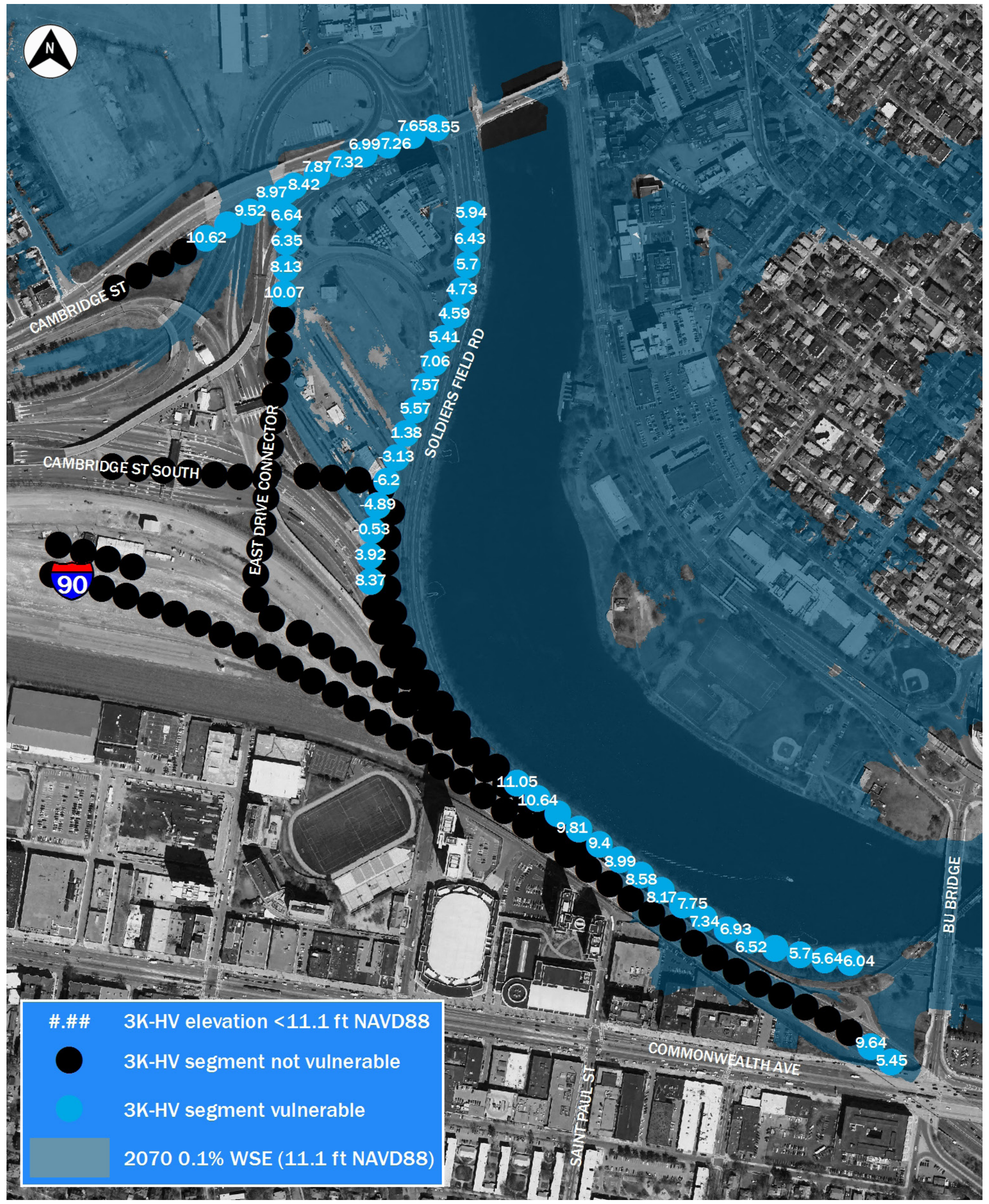
- The at-grade southeastern portion of SFR between Agganis Arena and the BU Bridge (SFR 0+00 to SFR 15+00 and associated ramps);
- The at-grade eastern portion of I-90 adjacent to the Commonwealth Avenue overpass (I-90 69+00 to I-90 70+00) potentially flooding additional eastern portions of I-90;
- The northern at-grade and underpass segment of SFR (SFR 29+00 to SFR 40+00) with subsequent inundation into lower portions of the underpass (SFR 25+00 to SFR 28+00);
- The eastern at-grade portion of Cambridge Street (CS 40+00 to CS 50+00); and
- The northern portion of the East Drive Connector (EDC 13+00 to EDC 17+00).



Graphic 5.19-1: 3K-HV exposure to 1% probability inundation in 2070

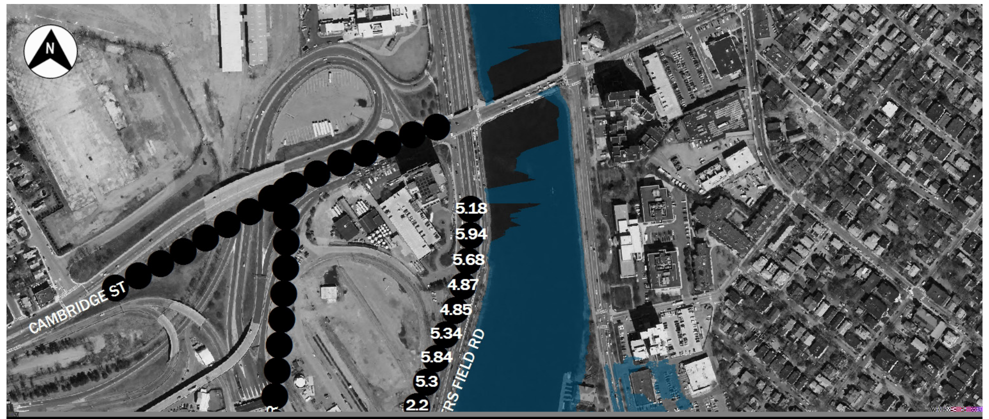
Review of the 3K-HV section (at narrowest point along Charles River) indicates that I-90 Eastbound and Westbound (elevated by bridge/structure above the railways) are not vulnerable to any flooding. However, the PDW Path, SFR, the GJR Line, and the rail yard are all likely exposed to inundation at the 2070 0.1% probability level.

Depending on the final grading plan and barriers resulting from the proposed infrastructure, portions of land in the Project Area may also be subject to inundation at the 2070 0.1% probability level, including the BU campus northeast of the intersection of Commonwealth Avenue and St. Paul Street and the area north of Cambridge Street South and east of the Cattle Drive Connector. Depending on the final grading plan, portions of the PDW Path will likely be subject to inundation at the 2070 0.1% probability level.


N
CAMBRIDGE ST
CAMBRIDGE ST SOUTH
EAST DRIVE CONNECTOR
SOLDIERS FIELD RD
BU BRIDGE
COMMONWEALTH AVE
SAINT PAUL ST
90
7.65 8.55
6.99 7.26
7.87 7.32
8.97 8.42
9.52 6.64
10.62
6.35
8.13
10.07
5.94
6.43
5.7
4.73
4.59
5.41
7.06
7.57
5.57
1.38
3.13
6.2
-4.89
0.53
3.92
8.37
11.05
10.64
9.81
9.4
8.99
8.58
8.17 7.75
7.34 6.93
6.52
5.7 5.64 6.04
9.64
5.45
#.## 3K-HV elevation <11.1 ft NAVD88
● 3K-HV segment not vulnerable
● 3K-HV segment vulnerable
▨ 2070 0.1% WSE (11.1 ft NAVD88)

Graphic 5.19-2: 3K-HV exposure to 0.1% probability inundation in 2070

All other portions of this proposed action are either planned at elevations above 11.1 ft NAVD88, or protected from inundation by existing topographic features. Graphic 5.19-2 presents the Concept 3K-HV exposure to 0.1% probability inundation in 2070.


N
CAMBRIDGE ST
RS FIELD RD
5.18
5.94
5.68
4.87
4.85
5.34
5.84
5.3
2.2

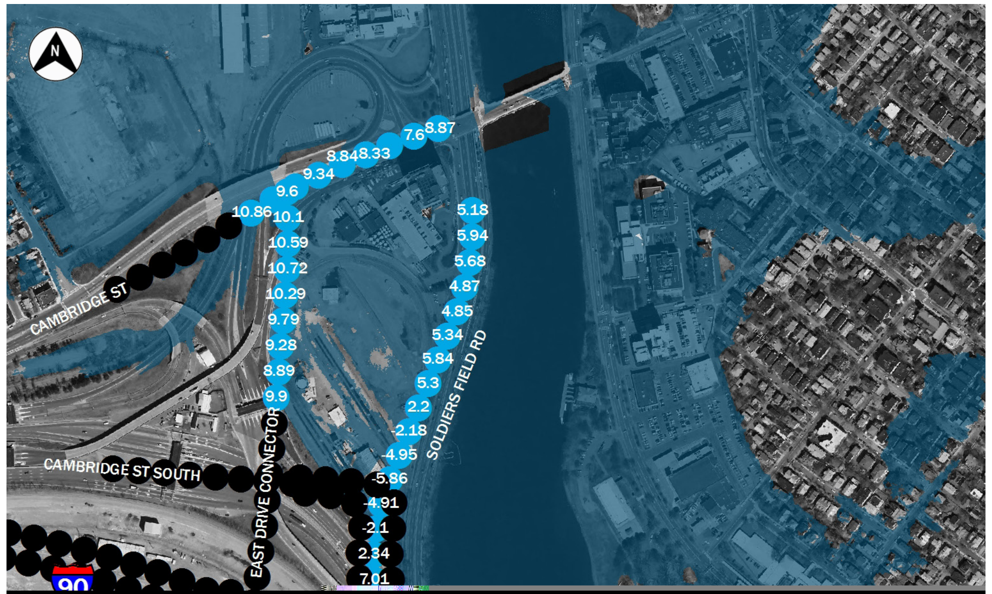
Graphic 5.19-3: 3K-AMP exposure to 1% probability inundation in 2070

3K-AMP

At the 1% probability level, Concept 3K-AMP is vulnerable to 2070 flooding only along the at-grade southeastern portion of SFR near the BU Bridge (SFR 1+00 to SFR 3+00). All other portions of this proposed action are either planned at elevations above 6.3 ft NAVD88, or protected from inundation by existing topographic features. Graphic 5.19-3 presents the Concept 3K-AMP exposure to 1% probability inundation in 2070.

At the 0.1% probability level, Concept 3K-AMP is vulnerable to 2070 flooding along:

- The at-grade southeastern portion of SFR between Agganis Arena and the BU Bridge (SFR 0+00 to SFR 15+00 and associated ramps);
- The at-grade eastern portion of I-90 east of Nickerson Field (I-90 48+00 to I-90 70+00) potentially flooding additional eastern portions of I-90;
- The northern at-grade and underpass segment of SFR (SFR 29+00 to SFR 40+00) with subsequent inundation into lower portions of the underpass (SFR 25+00 to SFR 28+00;,


N
CAMBRIDGE ST
CAMBRIDGE ST SOUTH
EAST DRIVE CONNECTOR
SOLDIERS FIELD RD
90
7.6 8.87
8.84 8.33
9.34
9.6
10.86 10.1
10.59
10.72
10.29
9.79
9.28
8.89
9.9
5.18
5.94
5.68
4.87
4.85
5.34
5.84
5.3
2.2
-2.18
-4.95
-5.86
-4.91
-2.1
2.34
7.01

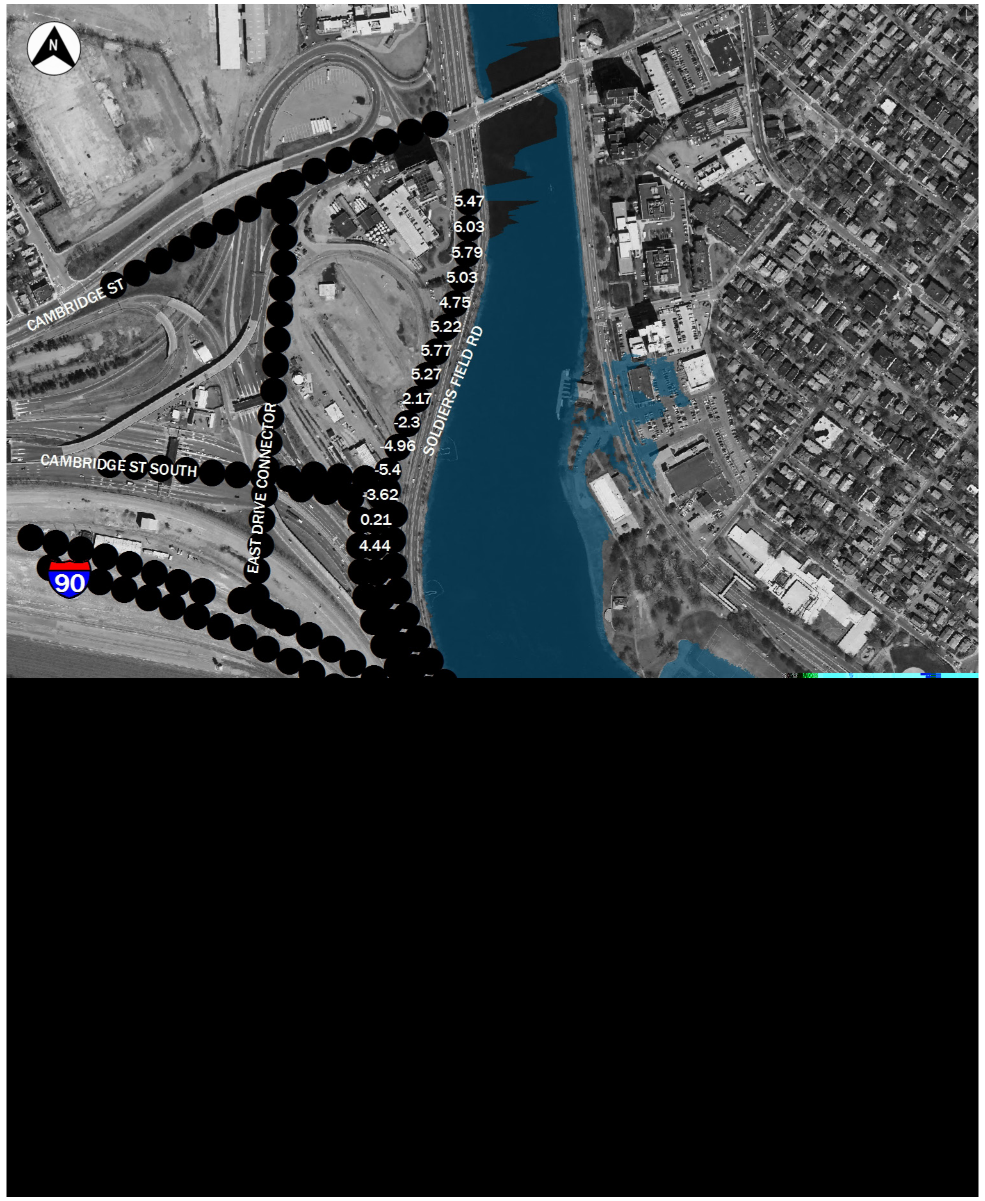
Graphic 5.19-4: 3K-AMP exposure to 0.1% probability inundation in 2070

- The eastern at-grade portion of Cambridge Street (CS 40+00 to CS 50+00); and
- The northern portion of the East Drive Connector (EDC 12+00 to EDC 17+00).

Review of the 3K-AMP section (at narrowest point along Charles River) indicates that the GJR (elevated above the potentially flooded I-90 Eastbound) is not vulnerable to any flooding, while some portion of the rail yard is likely exposed to inundation at the 2070 0.1% probability level.

Depending on the final grading plan and barriers resulting from the proposed infrastructure, portions of land in the Project Area may also be subject to inundation at the 2070 0.1% probability level, including the BU campus northeast of the intersection of Commonwealth Avenue and St. Paul Street and the area north of Cambridge Street South and east of the Cattle Drive Connector. Depending on the final grading plan, portions of the PDW Path will likely be subject to inundation at the 2070 0.1% probability level.

All other portions of this proposed action are either planned at elevations above 11.1 ft NAVD88, or protected from inundation by existing topographic features. Graphic 5.19-4 presents the Concept 3K-AMP exposure to 0.1% probability inundation in 2070.



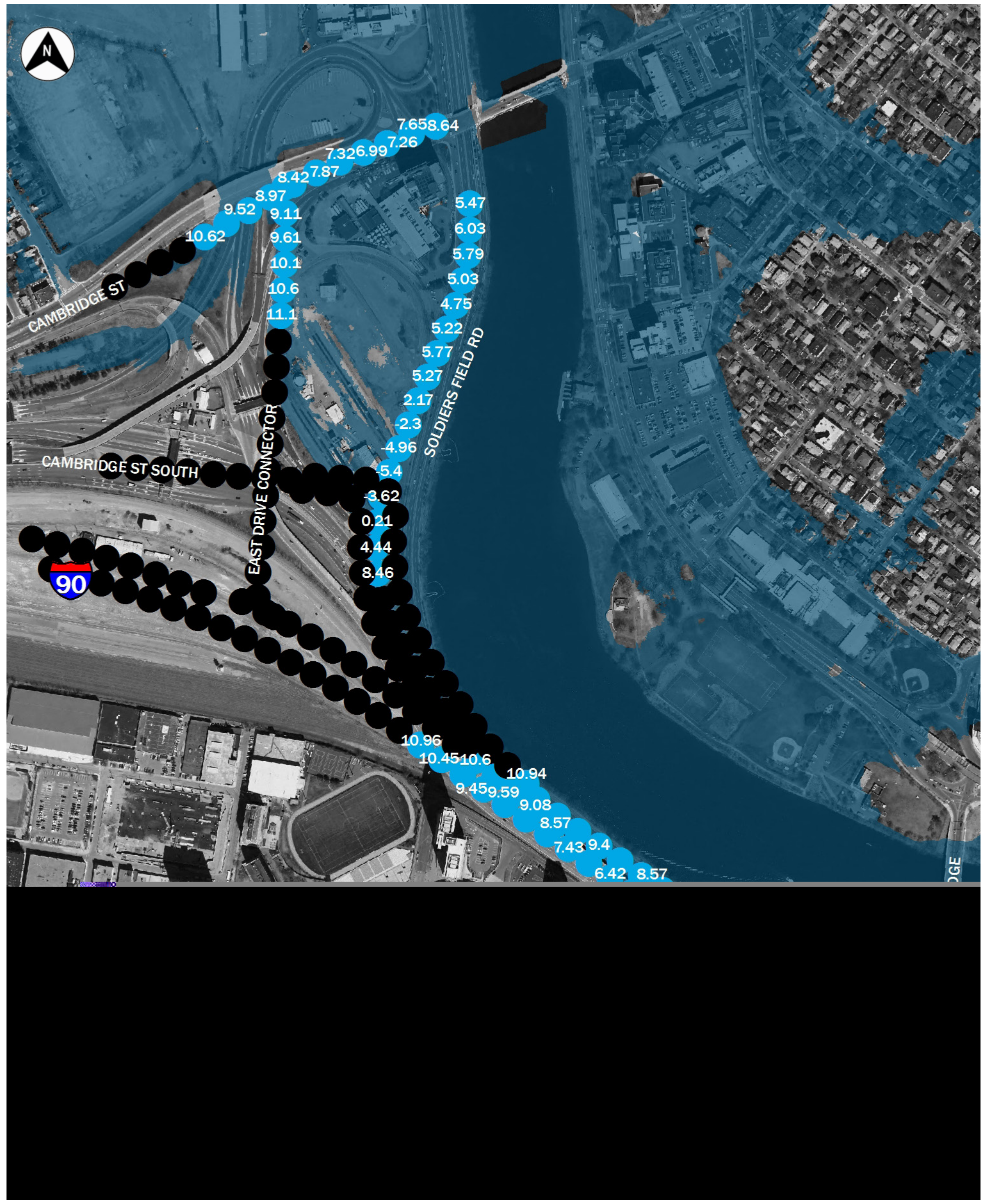
Graphic 5.19-5: 3K-ABC exposure to 1% probability inundation in 2070

3K-ABC

At the 1% probability level, Concept 3K-ABC is vulnerable to 2070 flooding only along an at-grade southeastern portion of SFR and the adjacent PDW Path near the BU Bridge probability inundation in 2070.

At the 0.1% probability level, Concept 3K-ABC is vulnerable to 2070 flooding along:

- The at-grade southeastern portion of SFR near the BU Bridge (SFR 1+00 to SFR 8+00);
- The at-grade eastern portion of I-90 east of St. Paul Street (I-90 58+00 to I-90 79+00) potentially flooding additional eastern portions of I-90;
- The northern at-grade and underpass segment of SFR (SFR 29+00 to SFR 40+00) with subsequent inundation into lower portions of the underpass (SFR 25+00 to SFR 28+00);



Graphic 5.19-6: 3K-ABC exposure to 0.1% probability inundation in 2070

- The eastern at-grade portion of Cambridge Street (CS 42+00 to CS 50+00); and
- The northern half of the East Drive Connector (EDC 8+00 to EDC 16+00).

Review of the 3K-ABC section (at narrowest point along Charles River) indicates that the GJR is not vulnerable to any flooding, while some portion of the rail yard may be exposed to inundation at the 2070 0.1% probability level.

Depending on the final grading plan and barriers resulting from the proposed infrastructure, portions of land in the Project Area may also be subject to inundation at the 2070 0.1% probability level, including the BU campus northeast of the intersection of Commonwealth Avenue and St. Paul Street and the area north of Cambridge Street South and east of the Cattle Drive Connector. Depending on the final grading plan, portions of the PDW Path may also be subject to inundation at the 2070 0.1% probability level.

All other portions of this proposed action are either planned at elevations above 11.1 ft NAVD88, or protected from inundation by existing topographic features. Graphic 5.19-6 presents the Concept 3K-ABC exposure to 0.1% probability inundation in 2070.

5.19.4 Heat Vulnerability

Paved surfaces are prevalent in urban areas, and are an essential component of highway and transportation corridors. However, the amount of paving and its albedo (degree of reflectivity) can be a driver of the urban heat island effect. The urban heat island effect is the occurrence of higher surface and ambient temperatures in urban settings than in surrounding rural areas due to human activity, most notably the conversion of vegetated surfaces to heat-absorbing non-vegetated surfaces. Other contributing factors to the urban heat island effect include urban geometry (which can trap heat or block convective cooling) and waste heat from automobiles and buildings. As global temperatures in the Northeast rise with the changing climate, the potential for exacerbated heat island effects increases.

Since low albedo surfaces are a primary driver of the urban heat island effect, they are the focus of this assessment. Low albedo surfaces in the urban fabric can be paved surfaces, such as roads, sidewalks and parking lots or building surfaces, such as roofs. Since the Project would alter roadways, these are the focus of this assessment.

Table 5.19-2: Existing and Proposed Impervious Areas

Scenario	Impervious Area (acres)
Existing Conditions	78.4
3K-HV	74.8
3K-AMP	72.1
3K-ABC	73.7

All three Throat Area Variations will reduce impervious area within the Project Area from current levels (See Table 5.19-2). Since the distribution of these impervious areas between paved roadways, paved sidewalks and paved parking lots has not been finalized for the proposed actions, the relative contribution of these varied albedo surfaces is unknown at present. Additionally, since limited data exist on Boston's regional heat island, the relative contribution of Project Area paved surfaces to the regional urban heat island effect is not known.

However, it is reasonable to assume that, since all three Throat Area Variations reduce total impervious area, these alternatives are likely to reduce urban heat island effect in the Project Area, all else being equal. Since Variation 3K-AMP demonstrates the most reduction in imperviousness from current conditions (5.3 acres), it will likely contribute the least to future urban heat island impacts. Variation 3K-ABC shows 4.2 acres of reduction, while Variation 3K-HV shows 3.6 acres of reduction. Any efforts to reduce the albedo of remaining impervious surfaces in the proposed alternatives should further reduce heat impacts for the Project Area.

5.20 Oil and Hazardous Materials

In the Commonwealth of Massachusetts, the assessment and mitigation of oil and/or hazardous material (OHM) when released into the environment is generally governed by the Massachusetts Contingency Plan (MCP) also known as 310 CMR 40.0000. When OHM impacts (or potentially impacts) an environmental medium, then a release (or threat of release) of OHM is said to occur. The MCP defines a "disposal site" as the place or area where an uncontrolled release of OHM has "come to be located". The MCP defines "response action" in broad terms, meaning assessments, containments or removals conducted in accordance with the MCP.

As noted in Section 4.20 (and further detailed in Appendix J Hazardous Materials Assessment Report), due to the presence of multiple disposal sites within the Project Area (see Figure 5.20-1), historical on-site industrial use, and the generally developed nature of the Project Area, it is likely that the Project will encounter OHM and OHM-impacted urban fill that will require special handling and management during construction. In accordance with the MCP process, each disposal site must be properly assessed and managed, and brought to regulatory closure (i.e. a Permanent or Temporary Solution) by the parties responsible for those releases. Therefore, implementation of required MCP response actions within any active disposal site must be taken into consideration during construction activities on a given disposal site in a manner consistent with the MCP.

Preliminary estimates indicate that the average Project cut volumes of the three Throat Area Variations will be approximately 500,000 cubic yards, and average Project fill volumes will be approximately 300,000 cubic yards. However, final off-site disposition volumes will be heavily dependent on construction sequencing and re-use opportunities, which will be determined during construction phase planning. As discussed below, cut materials will be managed in accordance with all applicable regulations and policies.

5.20.1 No Build

Highway

The No Build Alternative will not result in any new construction within the highway sections of the Project Area, including the throat area. Therefore, throughout the highway sections in the Project Area, there will be no significant effect under the No Build Alternative. However, as discussed in Section 3.2, the current structural condition of the viaduct is such that this important piece of infrastructure must be rehabilitated extensively regardless of the advancement of the Project. Major rehabilitation of the viaduct is therefore included as part of the No Build Alternative. To the extent that such work will entail earthwork in support of foundation rehabilitation, OHM-impacted soils may be encountered. Media (soil or groundwater) encountered during such potential earthwork will require assessment, as well as management under the appropriate regulatory framework if work is conducted within existing MCP disposal site boundaries, or if new reportable conditions are observed. To the extent that OHM-impacted soils will be removed from the site as excess to the viaduct rehabilitation activities, removal of OHM mass from the site will be considered an improvement to the site. Such work will be required whether the Project is advanced or not.

Existing MassDEP disposal sites are required to eventually achieve regulatory closure in accordance with the MCP. Therefore, whether or not the Project is advanced, the appropriate assessments and MCP response actions will continue in order for the Potentially Responsible Party (PRP) to remain in compliance with the regulations.

Rail Operations and West Station

Existing MassDEP disposal sites are required to eventually achieve permanent regulatory closure in accordance with the MCP. The No Build Alternative will not result in any new construction within the rail yard or Worcester Main Line ROW; however, the appropriate assessments and response actions will continue in order for the PRP to remain in compliance with the regulations.

The No Build Alternative will not result in any new construction in the rail yard or Worcester Main Line ROW; therefore, as there are no active disposal sites and no provisions of the Activity and Use Limitations (AULs) to be triggered, there will be no effect under the No Build Alternative. AULs are a type of deed restriction that dictate Obligations and Conditions for future land use activities to maintain a Condition of No Significant Risk to human health and the environment from residual OHM impacts.

5.20.2 I-90 Urban Interchange Preferred Alternative

Highway

A total of 77 MCP disposal sites were identified within the Project Area. Most of these have reached regulatory solutions with Permanent Solutions. However, nine disposal sites were identified that are listed as either still active (five sites) or currently under Temporary Solution Status (four sites) within areas that will potentially be impacted by anticipated Highway construction activities. Temporary Solutions must be periodically re-evaluated for feasibility of achieving Permanent Solution until such time as a Permanent Solution is reached. Similarly, work on the still active disposal sites will continue until a Permanent Solution is reached. Therefore, the PRP will continue work on these disposal sites during and after completion of this Preferred Alternative, unless completed prior to its initiation. To the extent practicable, MassDOT will coordinate activities with active disposal site PRPs who oversee response actions at disposal Sites within the Project Area.

As discussed in Section 4.20, the site may be impacted with residual OHM, including metals, polycyclic aromatic hydrocarbons (PAHs), creosote- or arsenic- laced railroad ties, herbicides, pesticides, lubricating oils, diesel fuel, diesel exhaust, and other regulated material associated with rail operations and building materials. In addition, fill of unknown origin used to bring tracks to grade may contain debris, coal, coal ash, coal slag, or other potential regulated materials. All of these materials may potentially be encountered during highway construction activities. Details of the releases associated with the specific disposal sites are presented in the Hazardous Materials Assessment Report, Appendix J. This includes the names of the PRPs and the compliance schedules for the five active sites within the Project Area. It is worth noting that in addition to the impacted soils that may be encountered throughout the Project Area, there are a few pockets of known release of petroleum products that may be encountered during excavation, particularly near the groundwater table in and near Area B. To the extent general locations of concern can be identified prior to construction, they will be incorporated into project planning and Soil Management Plans (SMPs) or equivalent.

Project planning will incorporate knowledge of known MCP-related site conditions with respect to soil and groundwater management and also worker and neighborhood health and safety during construction. Re-use of soil on site is the preferred option for materials management. In some sections of the Project Area, site conditions have been sufficiently characterized during previous investigations to inform management plans. Other areas may warrant pre-construction characterization depending on site history or project goals. In such cases, preliminary pre-construction soil and groundwater testing will be conducted to inform re-use options and health and safety planning. Should potentially reportable conditions be observed, the results will be forwarded to the site owner for their use in evaluating their reporting obligations under the MCP. In cases where a contractor is responsible for a release of OHM, the contractor will be responsible for managing the release. In cases of non-construction-related newly discovered reportable conditions, the site owner, or other identified PRP, will be responsible for MCP response actions. However, to the extent practicable, such response actions may be coordinated with construction activities. In all cases, soil or groundwater with known OHM-impacts that are encountered during construction will be managed in accordance with the applicable state and federal regulations.

To the extent existing infrastructure will be demolished, handling and management of construction and demolition waste and hazardous building materials may be required. To inform demolition planning, the Project will perform pre-demolition building materials surveys, including asbestos surveys, lead based paint surveys, and other regulated construction materials, if warranted.

To inform stormwater management system design, MassDOT will conduct the appropriate assessments, such as mounding analyses and modeling, to evaluate the feasibility of assimilating hydraulic load and also the potential for significant remobilization of OHM in subsurface media due to alteration of stormwater infiltration patterns.

Rail Operations

This section discusses the potential impacts on OHM from the rail yard operations and West Station. This section includes the potential impacts on OHM from the proposed station because the station falls within the same geographic area as the rail yard operations and Worcester Main Line ROW. Although there are several disposal sites (active and closed) that have been documented within the Project Area, all disposal sites located within the Rail Yard/Throat Area portion have achieved permanent regulatory closure. However, two of the closed disposal sites located within the Rail Yard/Throat Area, see Figure 5.20-2, have achieved permanent regulatory closure through a Permanent Solution with Conditions that depends upon the implementation of four (4) distinct Activity and Use Limitations (AULs).

AULs are a type of deed restriction that dictate Obligations and Conditions for future land use activities to maintain a Condition of No Significant Risk to human health and the environment from residual OHM impacts. In particular, there is an AUL associated with the entire disposal site tracked under RTN 3-30413 relative to impacted soils (site wide AUL), an AUL delineated by local impacts to groundwater by trichloroethylene (TCE AUL), an AUL delineated by local impacts to groundwater by 1,2-dichloropropane (DCP AUL), and an AUL delineated by local impacts to soil and groundwater by light non-aqueous phase liquids (LNAPL AUL). The general locations of these AULs are shown on Figure 5.20-2; additional details of the disposal sites associated with these AULs appear in Hazardous Materials Assessment Report Appendix J.

The AULs associated with these two disposal sites prohibit use of land in the disposal site boundaries for residential purposes, dormitories, nursing homes, assisted living facilities, cultivation of fruits and vegetables for human consumption, schools, and active recreational uses. Special precautions must also be taken to mitigate potential risk to future occupants of buildings constructed in areas where concentrations of volatile organic compounds in groundwater exceed applicable regulatory thresholds. The AULs also detail constraints on soil management and re-use within the disposal sites.

Construction is not expressly prohibited in these areas. However, construction activities in these areas must comply with the AUL conditions and with MCP practices and policies related to implementation and management of AULs, including materials management and building construction. Activities demonstrating compliance with the AUL and related MCP regulations and policies must be documented. Revisions to AUL conditions or to site uses would require amendments to the associated AULs; this is common practice when site conditions change, such as under redevelopment.

To inform the stormwater management system design, MassDOT will conduct the appropriate assessments, such as mounding analyses and modeling, to evaluate the feasibility of assimilating hydraulic load and also the potential for significant remobilization of OHM in subsurface media due to alteration of stormwater infiltration patterns. It should be noted that the existence of Permanent Solutions for the disposal sites in the rail yard/Throat Area indicates that plumes of dissolved OHM in groundwater and vapor-phase OHM must be stable or contracting to have satisfied the requirements for regulatory closure. Infiltration systems are not expressly prohibited in the Obligations and Conditions set forth in the AULs for the rail yard/Throat Area.

West Station

The footprint of the proposed station falls within the footprint of the rail yard and the Worcester Main Line; therefore, potential impacts on OHM from the construction of the proposed station are discussed under the previous section.

5.20.3 Throat Area Variations

All Variations

Potential oil and hazardous materials impacts vary across the Throat Area Variations only in that there are minor differences in depth of cut. For this reason, differences in impact across the three Throat Area Variations are considered insignificant, and discussion of all three are therefore incorporated into the general Highway discussion, above.

5.21 Construction Impacts

5.21.1 No Build

Rehabilitation of Existing Viaduct

In order to perform the major rehabilitation/superstructure replacement of the viaduct, a significant amount of temporary structure will be required in order to maintain three lanes of traffic in each direction during peak travel periods. Many of the repairs to the substructure elements and steel cross girders will be performed “offline” without impacting existing highway or railroad traffic by completing these repairs from below the viaduct.

The temporary structure needed for the superstructure replacement will primarily be located in the area between the north end of the existing viaduct and SFR. Isolated areas of additional temporary structure at the east end of the viaduct and at the I-90 eastbound on-ramp and I-90 westbound off-ramp is anticipated.

Traffic management on I-90 will require construction staging that maintains at least three 11-foot-wide temporary travel lanes in each direction during peak travel periods. Temporary 2-foot-wide concrete barriers will define the edges of work zones. Offsets of 2 feet between the edge of the closest travel lane and the barrier will be provided to separate public travel from the work zone.

The sequence of construction for this No Build Alternative will generally be as follows:

- **Stage 1:** Squeeze traffic to the south as far as possible, demolish the northernmost portion of the superstructure while maintaining three lanes in each direction, and construct temporary structure along the north edge of the viaduct.
- **Stage 2:** Move westbound traffic (3 lanes) to the temporary structure, move eastound traffic (3 lanes) to the remaining westbound lanes, and reconstruct the southern portion of the viaduct superstructure (I-90 EB lanes).
- **Stage 3:** Maintain westbound traffic (3 lanes) on the temporary structure, shift eastbound traffic (3 lanes) to the new eastbound superstructure built in Stage 2, and construct the center section of the new viaduct superstructure.
- **Stage 4:** Maintain eastbound traffic (3 lanes) on the new eastbound viaduct superstructure. Shift westbound traffic (3 lanes) from the temporary structure to the new center section of the viaduct superstructure built in Stage 3. Remove the temporary structure and complete the remainder of the new viaduct superstructure along the north side.

The eastbound and westbound on- and off-ramps are wide enough that these structures can be constructed half width at a time while still maintaining a lane of traffic at all times. Multiple shifts of traffic for these ramp connections may be needed in order to maintain these connections throughout the viaduct superstructure replacement.

5.21.2 I-90 Urban Interchange Preferred Alternative, Throat Area Variations

Proposed improvements associated with the Preferred Alternative (2040 Full Build) and the three Throat Area Variations will be constructed in several stages. While the staging represents construction of the 2040 Full Build, MassDOT anticipates constructing the Project in phases. For the purposes of this construction impacts analysis, it is assumed that all Project elements will be constructed under one contract. The scope of work included in each stage will be based on maintaining three available travel lanes in each direction on I-90, as described above, and two available lanes in each direction on SFR at all times to accommodate peak traffic flow. Selective phases of the work may require limited shoulder or lane closures during off-peak hours.

Each Throat Area Variation provides a minimum of one Worcester Main Line track required to maintain MBTA commuter rail service at all times, although short-term outages are expected for all three variations. Construction staging for each variation currently provides one Worcester Main Line track throughout construction; however, further engineering will be required to ensure prolonged closures will not be necessary for the 3K-AMP and 3K-ABC Variations. Available work zones are limited with these two variations due to the constrained horizontal and significantly modified vertical geometry of the narrow width at-grade/partially below-grade facilities. 3K-HV maintains the existing Throat Area horizontal and vertical configuration which simplifies staged construction of the highway and rail elements. Pedestrian and bicycle facilities along Cambridge Street will be maintained at all times while PDW Path access depends on the Throat Area Variation, where sections may be detoured and/or closed for safety purposes.

Construction impacts to the Worcester Main Line, GJR and PDW Path, as well as construction durations, for the three Throat Area Variations are provided in Table 5.21-1.

Table 5.21-1: Construction Impacts and Duration-Throat Area Variations

3K Variation Project Component	3K-HV	3K-AMP	3K-ABC
Worcester Main Line Construction Impacts	24 months intermittent impacts and low speed operations	12 months low speed operation with 24 months intermittent impacts	12 months low speed operation with 24 months intermittent impacts
Grand Junction Construction Shutdown	Short term outages (few weeks)	4 year minimum closure	3 year minimum closure
PDW Path Construction Impacts	No closures anticipated	5 year minimum closure or detour	Temporary intermittent closures for path relocations
Highway Operations/ Travel Lane Construction Impacts	Low	High	Intermediate
Construction Duration	6.5 years	8 years	6.5 years

A suggested general sequence of construction staging for each I-90 Urban Interchange and Throat Area Variation is outlined and illustrated in the following sections. Many elements of the interchange, connector roads and streets and rail construction will be similar, however, the variations’ impacts on the interchange ramp connections will vary. As the design of the Project advances, concept staging will be refined and reviewed with appropriate agencies.

Variation 3K-HV

Stage 1

Stage 1 (Figures 5.21-1 and 5.21-2) will begin construction of the new I-90 interchange and highway viaduct, temporary bridges over existing I-90, temporary rail track alignments, noise barriers and the Franklin Street Pedestrian Bridge. This and subsequent stages will also include work preparing required traffic lane alignment shifts. Erosion prevention and sediment control practices and temporary stormwater management areas will be constructed for this and subsequent stages. Sediment controls and temporary stormwater management areas will be maintained and relocated as necessary in subsequent stages and will not be addressed in staging summaries for 3K-ABC and 3K-AMP that follow 3K-HV.

Stage 2

Stage 2 (Figures 5.21-3 and 5.21-4) will continue construction of the new I-90 interchange and highway viaduct as well as temporary and permanent track alignments including West Station platforms.

Stage 3

Stage 3 (Figures 5.21-5 and 5.21-6) will continue construction of the new I-90 interchange and highway viaduct as well as permanent track alignments including West Station platforms.

Stage 4

Stage 4 (Figure 5.21-7 and 5.21-8) will continue construction of the new I-90 interchange and highway viaduct as well as permanent MBTA layover facility lead yard track alignment.

Stage 5

Stage 5 (Figures 5.21-9 and 5.21-10) will continue construction of the new I-90 interchange streets, SFR realignment and underpass, will complete the I-90 westbound off-ramp portion of the highway viaduct and will remove the temporary viaduct. Rail construction will consist of West Station, bus/kiss-n-ride loop, Malvern and Babcock Street pedestrian bridges and MBTA layover facility.

Stage 6

Stage 6 (Figures 5.21-11 and 5.21-12) will complete construction of the SFR realignment and new open space along the Charles River. Rail construction consisting of West Station, bus/kiss-n-ride loop, Malvern and Babcock Street pedestrian bridges and MBTA layover facility will be completed.

Variation 3K-AMP

Stage 1

Stage 1 (Figures 5.21-13 and 5.21-14) will begin construction of the new I-90 interchange, temporary SFR within the existing PDW Path, temporary bridges over existing I-90 and Franklin Street Pedestrian Bridge noise barriers. This and subsequent stages will also include work associated with preparing for traffic lane alignment shifts.

Stage 2

Stage 2 (Figures 5.21-15 and 5.21-16) will continue construction of the new I-90 interchange and temporary at-grade I-90 westbound alignment within throat area as well as permanent track alignments including West Station platforms. This stage will include construction of a new stormwater pump station and a rebuilt retaining wall at Nickerson Field.

Stage 3

Stage 3 (Figures 5.21-17 and 5.21-18) will continue construction of the new I-90 interchange, temporary at-grade I-90 eastbound upon demolition of eastbound portion of existing viaduct and West Station platforms. BU-impacted properties are demolished during this phase.

Stage 4

Stage 4 (Figure 5.21-19 and 5.21-20) will continue construction of the new I-90 interchange, permanent at-grade I-90 eastbound below the Cambridge Street bridge over I-90, permanent at-grade I-90 westbound within the Throat Area, portions of the GJR viaduct and West Station platforms.

Stage 5

Stage 5 (Figure 5.21-21 and 5.21-22) will continue construction of the new I-90 interchange, permanent at-grade I-90 westbound mainline and on-ramp below Cambridge Street bridge over I-90, SFR realignment and underpass with inbound and outbound ramps, GJR viaduct deck and tracks over at-grade I-90 eastbound and permanent Worcester Main Line within the Throat Area. BU facilities will be demolished, steam piping will be rerouted, and a new retaining wall will be built along Buick Street.

Stage 6

Stage 6 (Figures 5.21-23 and 5.21-24) will continue construction of the new I-90 interchange streets and completion of SFR within the throat area. Rail construction will consist of West Station, bus/kiss-n-ride loop, Malvern and Babcock Street pedestrian bridges and MBTA layover facility. The Worcester Main Line outbound track will be completed in the yard area as will the retained earth ramps for the GJR.

Stage 7

Stage 7 (Figures 5.21-25 and 5.21-26) will complete construction of the PDW Path and new open space along the Charles River. I-90 interchange and streets, SFR, West Station, bus/kiss-n-ride loop, Malvern and Babcock Street pedestrian bridges and MBTA layover facility will be completed.

Variation 3K-ABC

Stage 1

Stage 1 (Figures 5.21-27and 5.21-28) will begin construction of the new I-90 interchange, temporary viaduct west of the existing viaduct within BPY, temporary bridges over existing I-90, SFR and PDW Path realignments, noise barriers, and the Franklin Street Pedestrian Bridge. This and subsequent stages will also include work for traffic lane alignment shifts during subsequent stages.

Stage 2

Stage 2 (Figures 5.21-29 and 5.21-30) will continue construction of the new I-90 interchange and at-grade I-90 within the Throat Area as well as permanent track alignments including West Station platforms. This stage will include construction of a new stormwater pump station and rebuilding the retaining wall at Nickerson Field.

Stage 3

Stage 3 (Figures 5.21-31 and 5.21-32) will continue construction of the new I-90 interchange, temporary at-grade I-90 westbound upon demolition of a portion of the existing viaduct, GJR over I-90 bridge and West Station platforms.

Stage 4

Stage 4 (Figure 5.21-33 and 5.21-34) will continue construction of the new I-90 interchange, at-grade I-90 eastbound upon demolition of the existing westbound portion of the viaduct, GJR Bridge over I-90 and West Station platforms. Existing pump station is demolished below viaduct.

Stage 5

Stage 5 (Figures 5.21-35 and 5.21-36) will continue construction of the new I-90 interchange streets. Rail construction will consist of the permanent Worcester Main Line and GJR tracks within the Throat Area, West Station, bus/kiss-n-ride loop, Malvern and Babcock Street pedestrian bridges and MBTA layover facility.

Stage 6

Stage 6 (Figures 5.21-37 and 5.21-38) will complete construction of the SFR realignment and new open space along the Charles River, GJR Bridge over I-90, at-grade I-90 eastbound and westbound permanent alignments and interchange and streets. Rail construction consisting of West Station, bus/kiss-n-ride loop, Malvern and Babcock Street pedestrian bridges and MBTA layover facility will be completed. GJR embankment and tracks will be completed at the end of Stage 6 once westbound I-90 is opened to traffic and the temporary alignment can be abandoned near Commonwealth Avenue.

5.21.3 Construction Impacts on Boston University Property

Common to All Variations

Work to construct and operate the Project will impact BU property. Specific impacts will occur along the property line where the south rail platform is proposed. Permanent construction access and excavation work will require temporary easements. Construction of West Station and the proposed pedestrian ramp at Babcock Street may require construction vehicle and equipment access along Babcock Street. BU maintains ownership rights to the discontinued extension of Babcock Street north of its intersection with Ashford Street.

Another impact common to each variation will be the construction of a new noise barrier atop the retaining wall that separates the exterior athletics facilities (Nickerson Field) from the railroad. The noise evaluation determined that a noise barrier is both reasonable and feasible for this location.

Specific Impacts under the 3K-HV Variation

Work to construct and operate the Project under the 3K-HV Variation will have additional impacts to BU properties. These additional impacts are caused by the need to demolish and reconstruct the viaduct columns that are along the property line. While MassDOT possesses easements around these column locations, work may need to extend onto BU property along Buick Street (a discontinued city street) and within the properties lying between the railroad and Commonwealth Avenue to the east of Buick Street. These impacts are expected to be limited to the construction phase, with no permanent construction elements built outside of MassDOT’s current property-right areas.

Specific Impacts under the 3K-AMP Variation

Work to construct and operate the Project under the 3K-AMP Variation will have additional impacts to the BU properties. These may include the following:

- While further evaluation would be made during the detailed design phase of the Project, MassDOT anticipates that the existing retaining wall along Nickerson Field would be impacted due to the proposed shift of the inbound Worcester Main Line track and the need to lower the track profile through the Throat Area. Combined, these two factors may cause the existing wall to be exposed below its footing. Some impacts would occur within the field area along the property line by the existing wall as reconstruction is completed.
- Repositioning the inbound track along Buick Street and into BU property to the east of Buick Street will require a new retaining wall to be built along most or all of Buick Street from the existing wall at Nickerson Field and eastward. There is a 10-foot elevation difference between Buick Street at Nickerson Field, and moving the tracks closer to the street while also lowering the tracks will necessitate the retaining wall. Wall construction is expected to require temporary closure or temporary width reduction along Buick Street to excavate and form the wall.
- Railroad and at-grade highway work in this area will require lowering of an MWRA water supply main that crosses from Buick Street into the railroad area towards the Charles River. MassDOT expects that Buick Street will be closed while work is performed to lower the water supply main under the street and into the track and highway areas.
- Repositioning the inbound track into the BU properties to the east of Buick Street will encroach approximately 7 feet into an area occupied by two structures. One is an abandoned parking structure along Buick Street. The other is a fire escape on the northerly elevation of the Fine Arts building that also supports steam supply and condensate piping. BU also has at-grade parking in this area that will be impacted.
- There is an existing stormwater pump station situated below I-90 at the easterly limit of the existing viaduct. Construction of this variation will require demolition of this pump station and construction of a new pump station elsewhere in the immediate vicinity. This pump station is a crucial stormwater control feature of I-90. It collects stormwater draining from I-90 both east and west of the Commonwealth Avenue bridge and discharges it into the Charles River. A new pump station must be built before the old pump station can be demolished. The best location available for the new pump station would be on the unimproved property bounded by I-90, the BU bridge, the GJR and SFR. This unimproved property includes a parcel owned by BU. The pump station, the influent piping from I-90 and the effluent piping into the Charles River, a driveway from I-90 and parking for maintenance vehicles will occupy portions of this land.

Specific Property Impacts under the 3K-ABC Variation

Work to construct and operate the Project under the 3K-ABC Variation will have similar impacts to the BU properties as the 3K-AMP Variation described above.

- There is less likelihood that the existing retaining wall between Nickerson Filed and the tracks would be impacted because the inbound track profile does not need to be depressed under the 3K-ABC Variation.
- A new retaining wall will be required along Buick Street due to repositioning the tracks along the property line. The exposed height of the wall would be less than the height of the wall required under 3K-AMP, and it is expected to be of shorter length to the east. It is not expected that the work would require lowering the MWRA water supply main under this variation.
- The impacts to BU building structures and steam utilities to the east of Buick Street are expected to be the same as those required under 3K-AMP.
- The MassDOT pump station below I-90 at the east end of the viaduct will require reconstruction and relocation similar to the 3K-AMP variation.

5.22 Construction Phasing and Costs

MassDOT anticipates constructing the Project in three distinct phases. By phasing the core elements of the Project, MassDOT believes that future key elements, such as West Station, will be better integrated into the future development buildout as ridership demands increase. As currently envisioned MassDOT anticipates three construction phases. The core elements to be built in each of the three phases are described below.

5.22.1 Anticipated Construction Phases

Phase 1

The initial phase is assumed to be substantially complete by the year 2025 and includes the following Project components:

- Reconstruction and realignment of the I-90 mainline to the south, from the westerly limit at approximately Franklin Street to the easterly limit at approximately Commonwealth Avenue, including the construction of a new on- and off-ramp system;
- Realignment of a portion of SFR to the west further separating it from the Charles River and the PDW Path, depressing a segment of SFR into a short “boat section,” creating additional open space for enhanced recreational opportunities and stormwater management features;
- Relocation of the existing SFR westbound off-ramp to Cambridge Street/River Street to a point approximately 1,500 feet to the south, thereby creating space for expanding the PDW path at “the Narrows”;
- Reconstruction of Cambridge Street from Lincoln Street to SFR as a “Complete Street,” removing the existing grade separation at the I-90 ramps;
- Construction of a new roadway, Cambridge Street South, as a two-way Complete Street facility between North Harvard Street and SFR;
- Construction of a new eastbound on-ramp from the eastern terminus of Cambridge Street South onto SFR;
- Provision of a new expanded pedestrian/bicycle connection between the Allston neighborhood and the PDW Path via the north side of Cambridge Street South over the relocated and lowered (boat section) SFR mainline adjacent to the relocated westbound off ramp;
- Construction of three north/south connector roads between the I-90 ramp system and Cambridge Street as two-way facilities with varying pedestrian and bicycle accommodations: West Connector, Seattle Street Connector and Cattle Drive Connector;
- Construction of East Drive Connector/East Drive (a fourth north/south connector road) with pedestrian and bicycle accommodations between the I-90 ramp system and the North Connector as a two-way facility;
- Construction of the North Connector Road with pedestrian and bicycle accommodations as a one-way westbound facility between the SFR Frontage Road and Cattle Drive with connections to Cambridge Street;
- Construction of new and reconstruction of existing traffic signal systems at 15 locations within the Project Area;
- Reconstruction of the existing pedestrian/bicycle bridge over I-90 between Lincoln Street/Franklin Street and Cambridge Street;
- Construction of a new pedestrian/bicycle connection (bridge structure over rail yard) between Malvern Street and the reconfigured I-90 Interchange;
- Discontinuance of the existing rail spur to the Houghton Chemical site;
- Adjustments to Worcester Main Line and GJR tracks to coincide with I-90 realignment in the Throat Area;
- Realignments to Worcester Main Line and siding track to the west of Cambridge Street to support proposed operations and changes in BPY and the Throat Area;
- Improvements to the rail yard, such as providing plug in power supply for idling trains and associated minor track realignment to the yard ladder to avoid conflicts with I-90, and to be able to store up to 8 train sets on four tracks within the MBTA Easement Area; under the 3K-HV and 3K-ABC Variations; Under the 3K-AMP Variation, the four existing yard tracks would be displaced by the retained fill structure carrying the GJR tracks between the rail viaduct and existing grades in the BPY. There would be no layover yard at BPY under 3K-AMP; and
- Construction of four (or five for 3K-HV) new noise barrier walls: one noise barrier wall will be constructed along the southerly property line of BPY, west of Malvern Street; two noise barrier walls will be constructed between Lincoln Street and I-90, with separation between these walls at Everett Street, and one (or two for 3K-HV) noise walls between BU Nickerson Field and the Worcester Main Line and I-90.

This phase also assumes that there will be one additional roadway constructed by others (Harvard University) by 2025. That roadway is East Drive between the North Connector and Western Avenue, as a two-way facility.

These components are illustrated in Figures 5.22-1, 5.22-2 and 5.22-3.

Table 5.22-1: I-90 Allston Interchange - Conceptual Cost Estimate

Construction Elements	No Build	Throat Area Variation		
		3K-HV	3K-AMP	3K-ABC
I-90 Urban Interchange	$175.6 M	$457.5 M	$352.7 M	$359.6 M
Rail Operations	$82.0 M	$82.4 M	$297.0 M	$138.6 M
West Station	$0	$95.6 M	$89.0 M	$96.2 M
Sub-Total	**$257.6 M**	**$635.5 M**	**$738.7 M**	**$594.4 M**
Construction Escalation 3.5% (present to midpoint of construction)	$58.0 M	$143.0 M	$190.9 M	$133.7 M
Contingency 35%	$110.5 M	$272.4 M	$325.3 M	$254.8 M
Total	**$426.1 M**	**$1.05 B**	**$1.25 B**	**$982.9 M**

Conceptual costs provided are representative of the No Build and 2040 Build Conditions

Phase 2

The second phase of the Project, which for the purposes of this DEIR is assumed to be completed in advance of 2040, includes the construction of the following additional core project components by MassDOT:

- Reconstruction of the BPY railroad facility into a modern layover and light maintenance facility for the MBTA;
- Construction of four additional layover tracks and associated switches and yard ladders on both sides of the yard. Layover tracks will allow two train sets to park on each track with a gap between for vehicular access. In total, the layover yard will hold a total of 16 train sets under the 3K-HV and 3K-ABC Variations. (Under the 3K-AMP Variation, the four new tracks would be constructed, providing for total storage capacity of 8 train sets);
- Construction of utilities and associated hookups to service train sets including plug ins to reduce locomotive idling to no more than 30 minutes; water for cooling and domestic service, and air to recharge brakes;
- Construction of paved surfaces between track pairs and around the perimeter to provide vehicular access to train sets and circulation through the yard area;
- Construction of paved access to the yard from surrounding street networks for yard personnel, staff parking, deliveries, and fueling trucks;
- Construction of modular crew quarters for yard staff and train staff during the midday period;
- Construction of storage sheds for on-site materials to support light maintenance of train sets as well as for overall yard maintenance activities; and
- Construction of stormwater BMP systems.

These components are illustrated in Figures 5.22-4, 5.22-5 and 5.22-6.

Phase 3

The third phase of the Project, which for the purposes of this DEIR is also assumed to be completed by 2040, includes the construction of the following additional core Project components by MassDOT:

- Construction of additional main line tracks in the station area to serve future West Station operations;
- Construction of signal improvements to support additional tracks in the station area;
- West Station as a Commuter Rail Station with three platforms (two side platforms and one center island platform served by four tracks) and a multi modal bus concourse above the train tracks with bus berths, bus layover space, and drop-off/pick-up areas for passenger cars and private shuttles;
- Vehicular connections between the West Station Bus Loop and the reconfigured I-90 interchange at Seattle Street Connector and at Cattle Drive Connector; and
- Pedestrian/bicycle connection between West Station and the northern terminus of Babcock Street.

The third phase of the Project also assumes several additional roadways, or modifications to previously constructed roadways, will be constructed by Harvard University by 2040, including:

- Cattle Drive (between Cambridge Street and Western Avenue);
- Stadium Way (between Cambridge Street South and North Harvard Street);
- Hotel Drive with extension of SFR eastbound on-ramp (between SFR and Cattle Drive); and
- Widening of the North Connector Road to serve as a two-way facility between the SFR Frontage Road and Stadium Way.

These components are illustrated in Figures 5.22-7, 5.22-8 and 5.22-9.

5.22.2 Construction Cost

Conceptual construction costs were developed based on the DEIR conceptual designs for each Throat Area Variation. The Project will be constructed in phases, as previously described, and the construction costs provided are for the 2040 Full Build condition. Table 5.22-1 provides cost breakdowns for each variation by major elements and includes base construction cost, contingency, and escalation. Also included are the estimated costs for the No Build Alternative for comparative purposes.

5.23 Environmental Justice

While the Project is not subject to the EEA Environmental Justice (EJ) Policy, MassDOT has committed to evaluating the Project for potential impacts to the EJ community. Under the EJ Policy, enhanced public participation is required for the following projects as they undergo review in accordance with MEPA:

- Any project that exceeds the Environmental Notification Form (ENF) threshold for air, solid and hazardous waste (other than remediation projects), or wastewater and sewage sludge treatment and disposal; and
- The project site is located within one mile of an EJ population (or in the case of projects exceeding an ENF threshold for air, within five miles of an EJ population).

Enhanced public participation may include use of alternative media outlets such as community or ethnic newspapers, use of alternative information repositories, and translation of materials or interpretation services prior to and during public meetings where the relevant EJ population uses a primary language other than English in the home.

The Project does not exceed any of the above-described ENF thresholds. Potential adverse affects to EJ populations are described below, as are the Project's Public Outreach efforts.

None of the impacts associated with the Preferred Alternative will result in disproportionately high and adverse human health or environmental effects to EJ populations. EJ populations could be disproportionately affected if adverse impacts are concentrated in environmental justice communities. For this DEIR a broad range of potential adverse effects to environmental justice populations was evaluated. Of these effects, the following were determined to have a potential to adversely impact environmental justice populations:

- Land acquisition and job displacement;
- Increases in noise levels;
- Air quality; and
- Increases in traffic congestion.

5.23.1 Potential Adverse Effects

Land Acquisition and Job Displacement

The Project will require a ROW acquisition for the construction of the Franklin Street pedestrian bridge replacement to the west of the Cambridge Street bridge. The preferred option for the bridge location will require an acquisition of the former Ace Ticket building and local business parking, and relocation of the businesses in the building. Construction of the pedestrian/bicycle connector from the project to Malvern Street will require a partial property acquisition and permanent parking loss at 76 Ashford Street. None of these land takings involve private residences, and no people will be displaced as a result of the Project.

The proposed interchange improvements will result in productivity gains due to travel time and vehicle mile savings compared to the No Build network. By 2040, these transportation efficiency benefits of the improved interchange design are estimated to generate an additional 810 jobs, $62 million in new household income, and $143 million in expanded business output annually within the CTPS region overall.

With development of the BPY by 2040, as estimated by Harvard/CTPS, the regional economic effects of transportation efficiency benefits decline due to additional trips generated by the new development. However, these benefits are still greater than under the No Build. Overall regional impacts, counting transportation efficiency benefits and the direct, indirect and induced effects of BPY development, are estimated to include an additional 9,940 jobs, $868 million in household income, and $1,915 million in expanded business output annually.

Increased Noise Levels

The Project would affect noise conditions throughout the Study Area. The following summarizes the effects in different neighborhoods within the Study Area.

In Allston Village and the Pratt Street and Wadsworth Street Area, the realignment of I-90 closer to residences and the introduction of the proposed West Station and the layover tracks would increase noise levels up to 2 dB (Ldn) compared to existing conditions. Prior to mitigation, there will be moderate noise impact according to the FTA criteria and noise levels will exceed the FHWA Noise Abatement Criteria (NAC). With the proposed noise barrier along the Worcester mainline tracks west of the proposed West Station, future noise condition will be substantially lower in this area than existing conditions.

In the BU area, the Project will cause potential severe noise impact according to FTA criteria at the College of Fine Arts, College of General Studies, and 10 Buick Street. Noise levels will exceed the NAC at certain locations including Nickerson Field for all three Throat Area Variations due to modifications to I-90, the Worcester Main Line, and the introduction of new special trackwork on the Worcester Main Line. A noise barrier along Nickerson Field will be feasible and reasonable according to MassDOT criteria. Future noise levels with the proposed barrier will be substantially lower at Nickerson Field.

Noise levels at PDW Path, Magazine Beach, Cambridgeport and Riverside will be similar or slightly reduced due to the Project. Noise levels will be reduced up to 13 dB along the PDW path near the proposed SFR underpass. Throughout the Throat Area and in Magazine Beach, the Project will reduce noise levels up to 3 dB relative to the No Build condition. Although noise levels will still exceed the FHWA NAC at some locations along the PDW Path, Magazine Beach, Cambridgeport and Riverside, noise barriers will not be feasible and reasonable for any Throat Area Variation.

In the Lower Allston area north of Cambridge Street, the proposed Project will reduce future noise conditions due to the reduction in traffic speeds and truck traffic on Cambridge Street. There will no noise impact according to FTA criteria. Although noise levels will exceed the NAC at some locations on Cambridge Street, noise mitigation will not be feasible and reasonable.

West of the physical limits of the Project, two potential Type II noise walls on the westbound (north) side of I-90 between Franklin Street and Everett Street and between Everett Street and Market Street were evaluated. The Project will not change the noise conditions in these areas. These noise walls have been on the MassDOT Type II priority list since 1992 and have been included in the noise study to evaluate the feasibility and reasonableness of mitigation. These Type II noise walls were included in the study since they are adjacent to the western Project terminus and the Project may facilitate the construction of these Type II barriers if they are still found to be feasible and reasonable. Noise barriers between Cambridge Street and Everett Street and between Everett Street and Market Street will be considered feasible and reasonable and will be considered likely to be constructed.

Based on the noise assessment results throughout the study area and the location of EJ communities, there will not be a disproportionate percentage of noise impacts in EJ communities.

Air Quality

Hot spots are areas where concentrations of one or more air pollutants are expected to be elevated. A CO Hot Spot analysis was conducted for the Project. For the Project Area, the analysis evaluated the five worst-case intersections based on level of service analysis, total traffic volume, and geographic coverage.

Based on the results of the CO modeling analysis at the selected traffic intersections in the air quality study area, increases in Project-related motor vehicle traffic volumes will not lead to exceedances of the Massachusetts or National Ambient Air Quality Standards (NAAQS) for CO and no adverse air quality impacts will occur with the Preferred Alternative or Throat Area Variations.

An air dispersion analysis was performed to assess the $PM_{2.5}$ and NO_2 impacts from the Project. The analysis focused on the emissions from the diesel trains operating at West Station and BPY and motor vehicles including intercity buses on roadways in the vicinity of West Station. The results of these modeling analyses demonstrated the 2040 Build Alternative for the three Throat Area Variations will not cause an exceedance of the NAAQS/MAAQS.

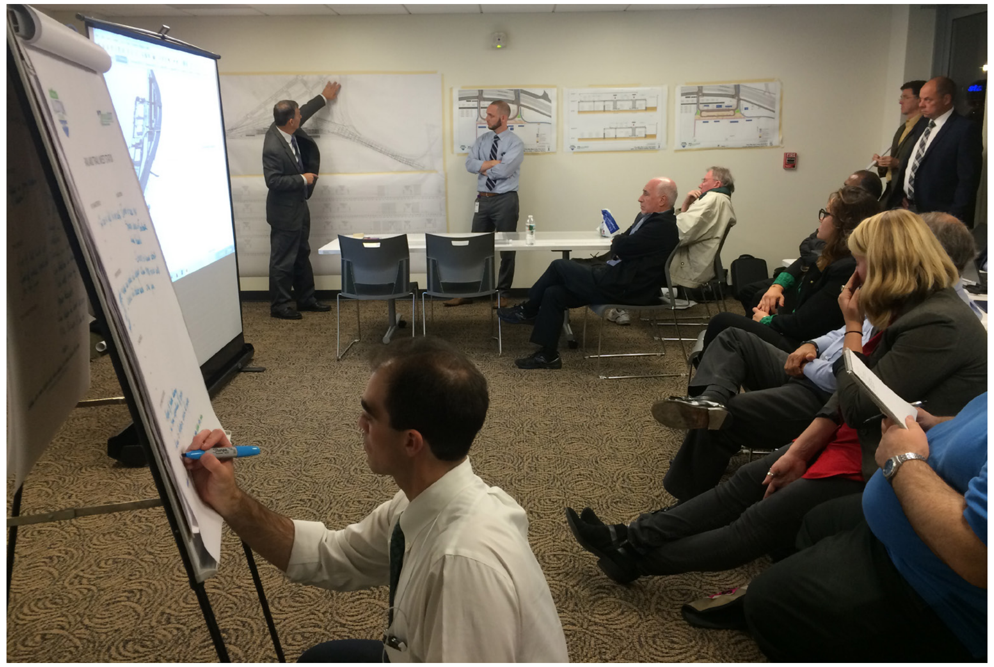
Traffic Congestion

The Build Alternatives will provide transportation benefits for the EJ population in the vicinity of the Project Area by enhancing their access to public transit system through the construction of West Station, and by reducing traffic congestion at the Allston interchange as compared to existing conditions.

Of the 35 intersections evaluated for the 2040 Design Year roadway network, 26 of those intersections are either new or modified intersections that will be constructed by MassDOT or Harvard University. Of the 26 new/modified intersections, all will meet MassDOT's design goal of achieving an overall LOS E in both peak hours. In fact, 23 of the 26 intersections will function at LOS D or better in both peaks, and operations at the other three intersections will be LOS D in the AM peak and LOS E in the PM peak.

Additionally, operational improvements will occur at the intersection of Cambridge Street and SFR, where overall operations will improve from LOS F to LOS B in both peak hours.

In the 2025 Opening Year, all intersections that will be created or modified by the Project will function at an overall LOS D or better in both the AM and PM peak hours. Additionally, there are several locations where the operations in 2025 will be better than in the 2015 Existing conditions because of the proposed interchange improvements. Most notable among those locations is the intersection of Cambridge Street/SFR, where operations will improve from LOS F to LOS B in the AM and PM peak hours.



MassDOT's Public Outreach Helps Inform the Community

Public Outreach

Outreach for the current DEIR period began in June 2015, with a Public Information Meeting at the Jackson-Mann Community Center and the reconstitution of the Task Force, followed by an initial Task Force meeting the following month. The DEIR-phase Task Force includes nearly all of the original members from the ENF phase, with a handful of exceptions, mainly to accommodate changes in representation within the included organizations. The Task Force is composed of local residents and activists, members of the Allston business community, and representatives of key institutional stakeholders such as Boston and Harvard Universities. A complete discussion of the public outreach effort is provided in Section 9.2.

From mid-2015, cognizant of the level of complexity associated with advancing the concept to the DEIR stage, and of the level of interest in Allston and abutting communities, MassDOT embarked on an extraordinary outreach program, maintaining a Project website and stakeholder list, and holding over the course of roughly two years:

- Twenty-two meetings with the Task Force, including sessions with the BPDA to discuss the Placemaking Study;
- Seven Public Information Meetings, including two in Cambridge and two in Brookline; and
- One site walk at the request of Task Force membership.

In addition to meetings organized by MassDOT, members of the Project team appeared at:

- Two meetings organized either fully or in part by Task Force membership and advocates interested in the Project; and
- One City of Boston organized open house in Allston. (This open house covered multiple topics of interest to Allston residents.)

LEGEND
🟥 DCR Ownership
🟩 MassDOT Highway/ Drainage Easement
🟪 MBTA Easement
🟦 City of Boston Easement
🟧 Proposed Roadway (by others)
Western Ave
Stadium Way
Cattle Drive
East Drive
North Connector
River St
Memorial D
Hopedale St
Sorrento St
Seattle St
Haskell St
Arden St
Holman St
N. Harvard St
Hooker St
Empire St
Cambridge St
Franklin St
Mansfield St
Royal St
Lincoln St
Seattle St
Connector
Stadium Way
Connector
Cattle Drive
Connector
East Drive
Connector
Soldiers Field Rd
Cambridge St
South
Lincoln St Conn.
West
Conn.
I-90
Wadsworth St
Ashford St
Linden St
Harvard Ave
Charles River
Bridge
BU
Gardner St
Malvern St
W Alcorn St
Babcock St
Harry Agganis Way
Brighton Ave
Commonwealth Ave
I-90

[redacted]

I-90 Allston Interchange Project
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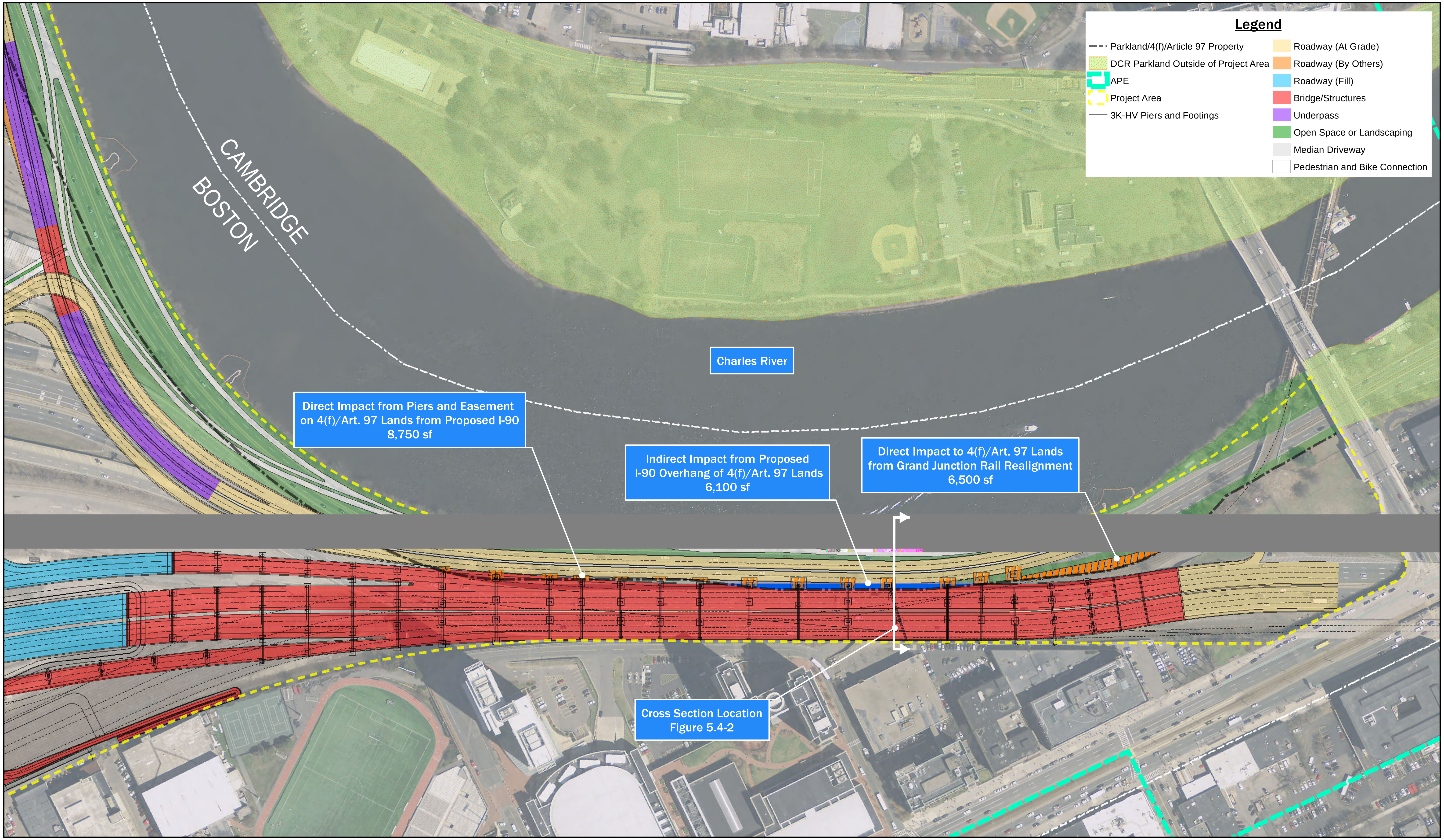
FIGURE
5.2-1

I-90 Urban Interchange, Concept 3K
Conceptual Jurisdictional Boundaries

0 250 500
Feet


CAMBRIDGE
BOSTON
Charles River
Legend
Parkland/4(f)/Article 97 Property
DCR Parkland Outside of Project Area
APE
Project Area
3K-HV Piers and Footings
Roadway (At Grade)
Roadway (By Others)
Roadway (Fill)
Bridge/Structures
Underpass
Open Space or Landscaping
Median Driveway
Pedestrian and Bike Connection

Direct Impact from Piers and Easement on 4(f)/Art. 97 Lands from Proposed I-90
8,750 sf

Indirect Impact from Proposed I-90 Overhang of 4(f)/Art. 97 Lands
6,100 sf

Direct Impact to 4(f)/Art. 97 Lands from Grand Junction Rail Realignment
6,500 sf

Cross Section Location
Figure 5.4-2

0 100 200
Feet

Notes:
1. APE - Area of Potential Effect
2. Boundary of 4(f), Article 97 and Historic Property is the Same

I-90 Allston Interchange Project
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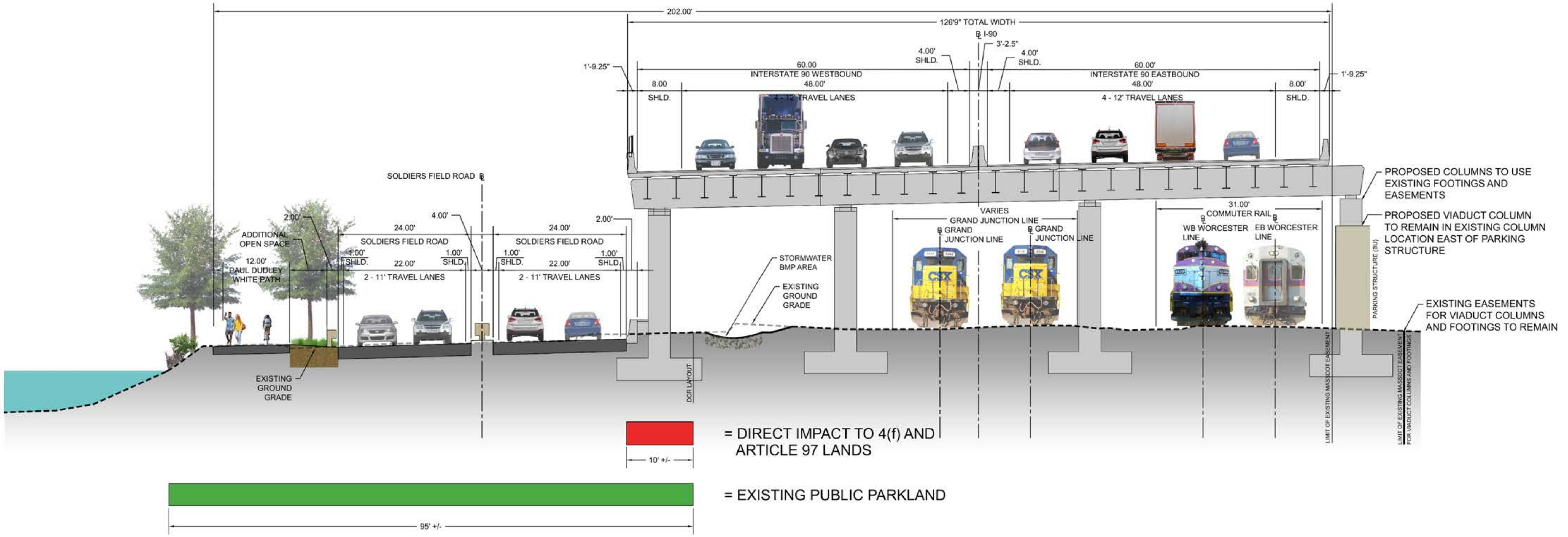
3K-HV Historic Resource and 4 (f)/Article 97 Impacts Throat Area

FIGURE
5.4-1

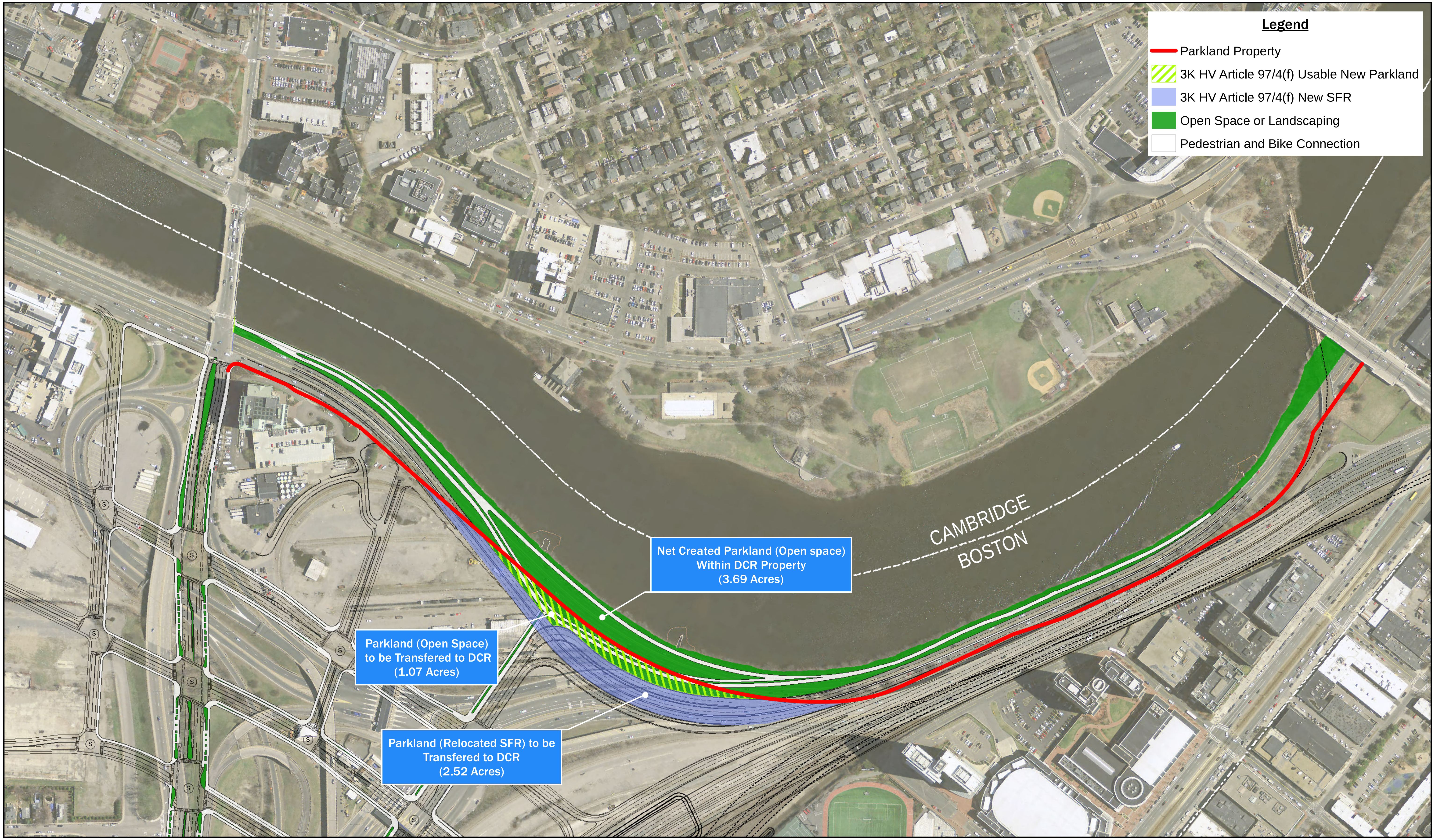

202.00'
126'9" TOTAL WIDTH
℄ I-90
3'-2.5"
4.00'
SHLD.
4.00'
SHLD.
1'-9.25"
60.00
INTERSTATE 90 WESTBOUND
48.00'
8.00
SHLD.
4 - 12' TRAVEL LANES
60.00'
INTERSTATE 90 EASTBOUND
48.00'
4 - 12' TRAVEL LANES
8.00'
SHLD.
1'-9.25"
SOLDIERS FIELD ROAD ℄
2.00'
ADDITIONAL
OPEN SPACE
12.00'
PAUL DUDLEY
WHITE PATH
4.00'
24.00'
SOLDIERS FIELD ROAD
1.00'
SHLD.
22.00'
1.00'
SHLD.
2 - 11' TRAVEL LANES
24.00'
SOLDIERS FIELD ROAD
2.00'
1.00'
SHLD.
22.00'
1.00'
SHLD.
2 - 11' TRAVEL LANES
EXISTING
GROUND
GRADE
DCR LAYOUT
STORMWATER
BMP AREA
EXISTING
GROUND
GRADE
VARIES
GRAND JUNCTION LINE
℄ GRAND
JUNCTION LINE
℄ GRAND
JUNCTION LINE
31.00'
COMMUTER RAIL
℄ WB WORCESTER
LINE
℄ EB WORCESTER
LINE
PARKING STRUCTURE (BU)
LIMIT OF EXISTING MASSDOT EASEMENT
LIMIT OF EXISTING MASSDOT EASEMENT
FOR VIADUCT COLUMNS AND FOOTINGS
PROPOSED COLUMNS TO USE
EXISTING FOOTINGS AND
EASEMENTS
PROPOSED VIADUCT COLUMN
TO REMAIN IN EXISTING COLUMN
LOCATION EAST OF PARKING
STRUCTURE
EXISTING EASEMENTS
FOR VIADUCT COLUMNS
AND FOOTINGS TO REMAIN
🟥 = DIRECT IMPACT TO 4(f) AND
ARTICLE 97 LANDS
10' +/-
🟩 = EXISTING PUBLIC PARKLAND
95' +/-

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE

4 (f) Land Impacts - 3K-HV
Section View

5.4-2


Legend
— Parkland Property
▨ 3K HV Article 97/4(f) Usable New Parkland
🟦 3K HV Article 97/4(f) New SFR
🟩 Open Space or Landscaping
⬜ Pedestrian and Bike Connection
CAMBRIDGE
BOSTON
S

Net Created Parkland (Open space)
Within DCR Property
(3.69 Acres)

Parkland (Open Space)
to be Transfered to DCR
(1.07 Acres)

Parkland (Relocated SFR) to be
Transfered to DCR
(2.52 Acres)

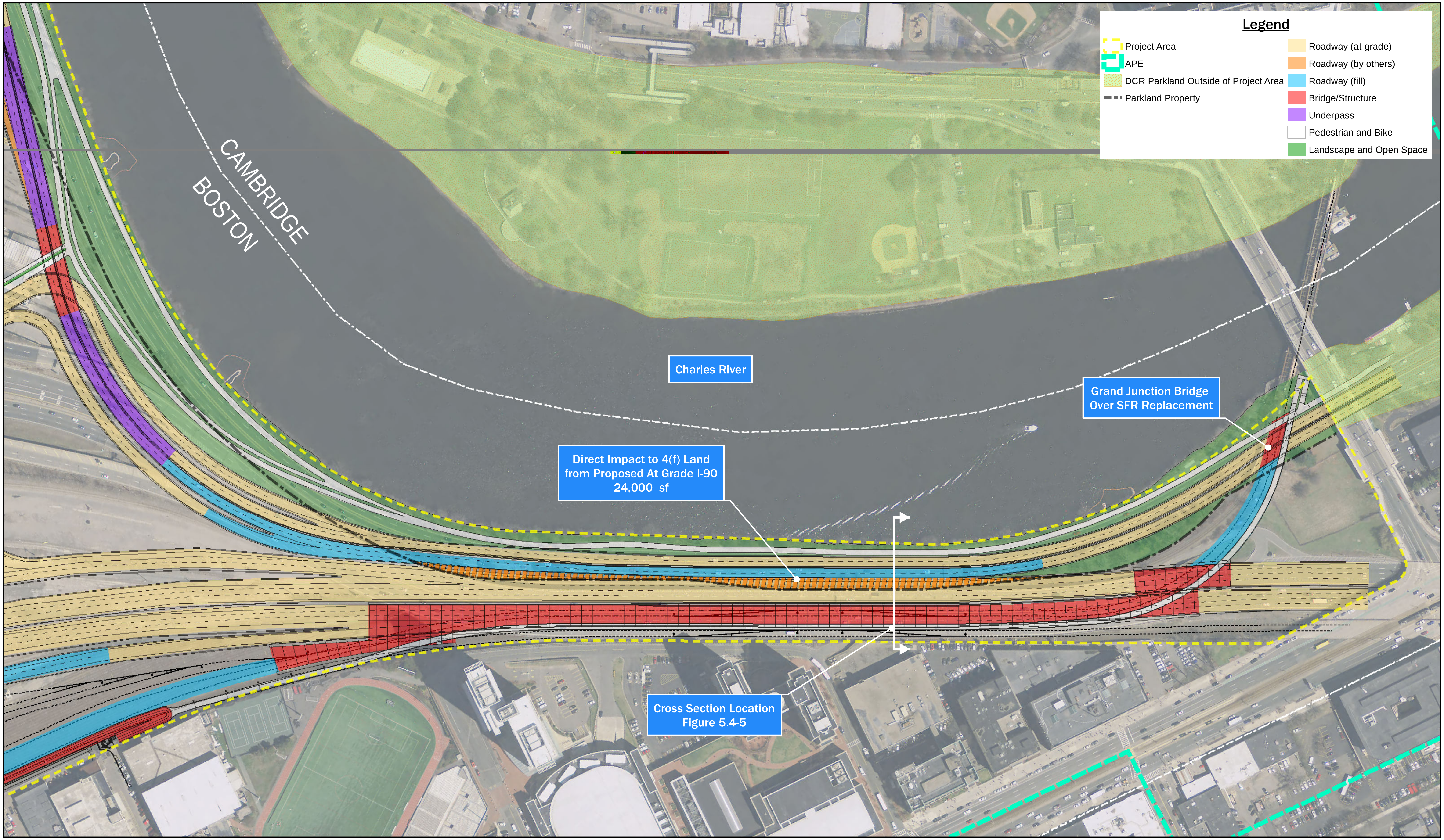
0 150 300
Feet

Notes:
1. Compensation for impacts to Article 97 Land
only includes land transferred to DCR

I-90 Allston Interchange Project
Draft Environmental Impact Report

Article 97/4(f) Parkland
Creation 3K-HV

FIGURE
5.4-3


Legend
Project Area
APE
DCR Parkland Outside of Project Area
Parkland Property
Roadway (at-grade)
Roadway (by others)
Roadway (fill)
Bridge/Structure
Underpass
Pedestrian and Bike
Landscape and Open Space
CAMBRIDGE
BOSTON
Charles River
Grand Junction Bridge Over SFR Replacement
Direct Impact to 4(f) Land from Proposed At Grade I-90 24,000 sf
Cross Section Location Figure 5.4-5
0
100
200
Feet

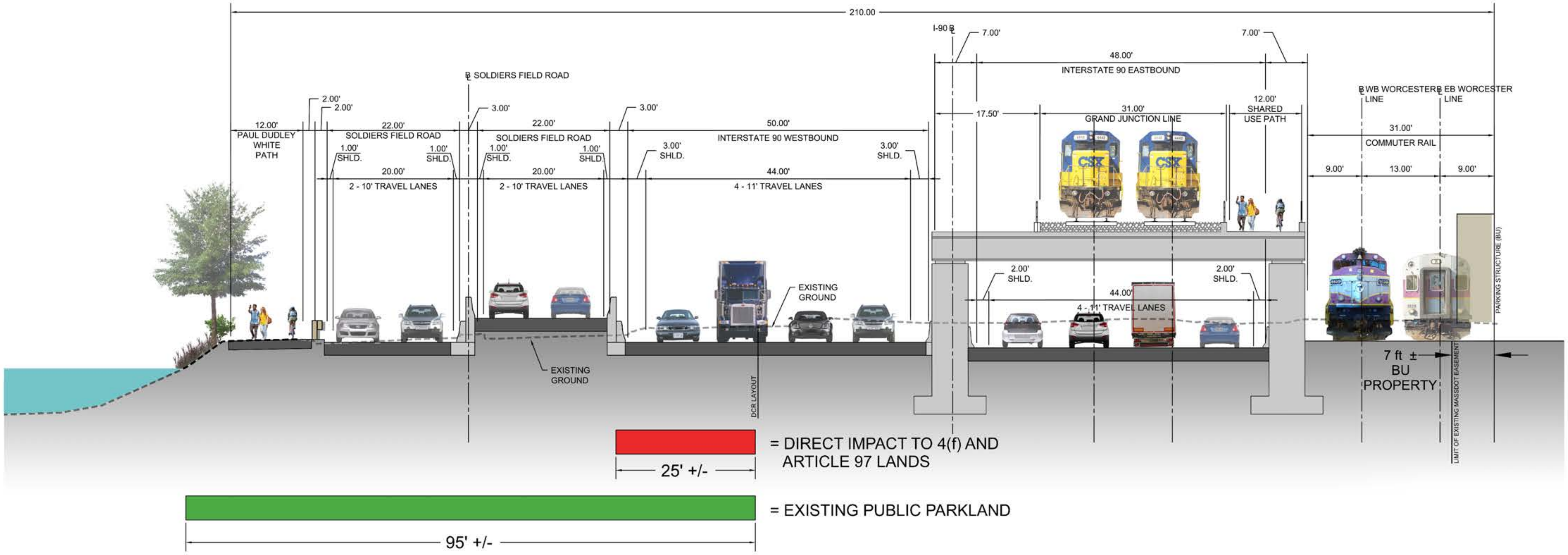
Notes:
1. APE - Area of Potential Effect
2. Boundary of 4(f), Article 97 and Historic Property is the Same

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE

3K-AMP Historic Resource and 4 (f)/Article 97 Impacts Throat Area

5.4-4

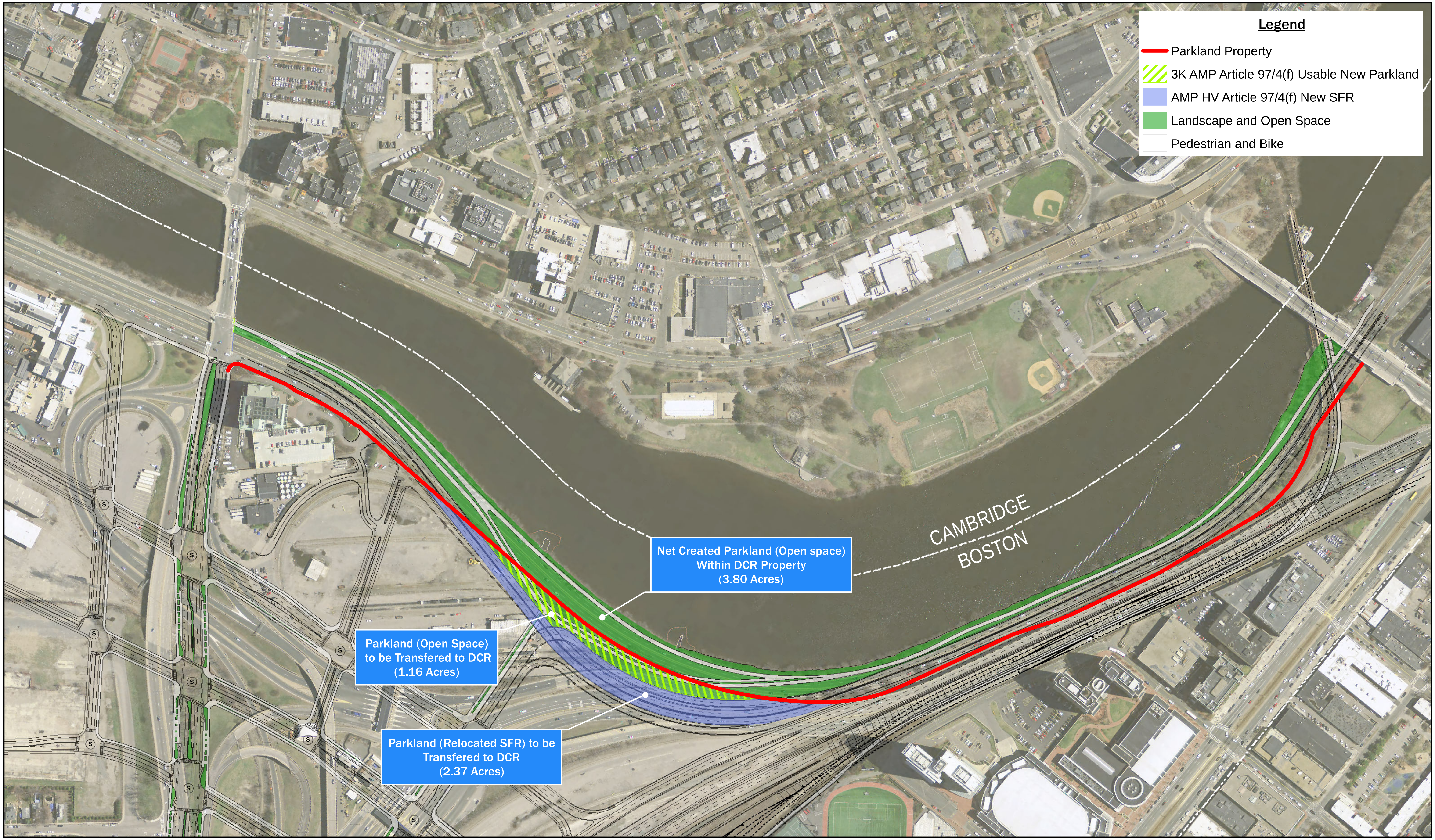

210.00
I-90 ℄
7.00'
7.00'
48.00'
INTERSTATE 90 EASTBOUND
℄ SOLDIERS FIELD ROAD
2.00'
2.00'
3.00'
3.00'
12.00'
PAUL DUDLEY WHITE PATH
22.00'
SOLDIERS FIELD ROAD
1.00' SHLD.
1.00' SHLD.
20.00'
2 - 10' TRAVEL LANES
22.00'
SOLDIERS FIELD ROAD
1.00' SHLD.
1.00' SHLD.
20.00'
2 - 10' TRAVEL LANES
50.00'
INTERSTATE 90 WESTBOUND
3.00' SHLD.
3.00' SHLD.
44.00'
4 - 11' TRAVEL LANES
17.50'
31.00'
GRAND JUNCTION LINE
12.00'
SHARED USE PATH
℄ WB WORCESTER LINE
℄ EB WORCESTER LINE
31.00'
COMMUTER RAIL
9.00'
13.00'
9.00'
PARKING STRUCTURE (BU)
EXISTING GROUND
EXISTING GROUND
2.00' SHLD.
2.00' SHLD.
44.00'
4 - 11' TRAVEL LANES
DCR LAYOUT
7 ft ±
BU PROPERTY
LIMIT OF EXISTING MASSDOT EASEMENT
= DIRECT IMPACT TO 4(f) AND ARTICLE 97 LANDS
25' +/-
= EXISTING PUBLIC PARKLAND
95' +/-

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE

4 (f) Land Impacts - 3K-AMP
Section View

5.4-5


Legend
Parkland Property
3K AMP Article 97/4(f) Usable New Parkland
AMP HV Article 97/4(f) New SFR
Landscape and Open Space
Pedestrian and Bike
CAMBRIDGE
BOSTON
0 150 300
Feet

Net Created Parkland (Open space) Within DCR Property (3.80 Acres)

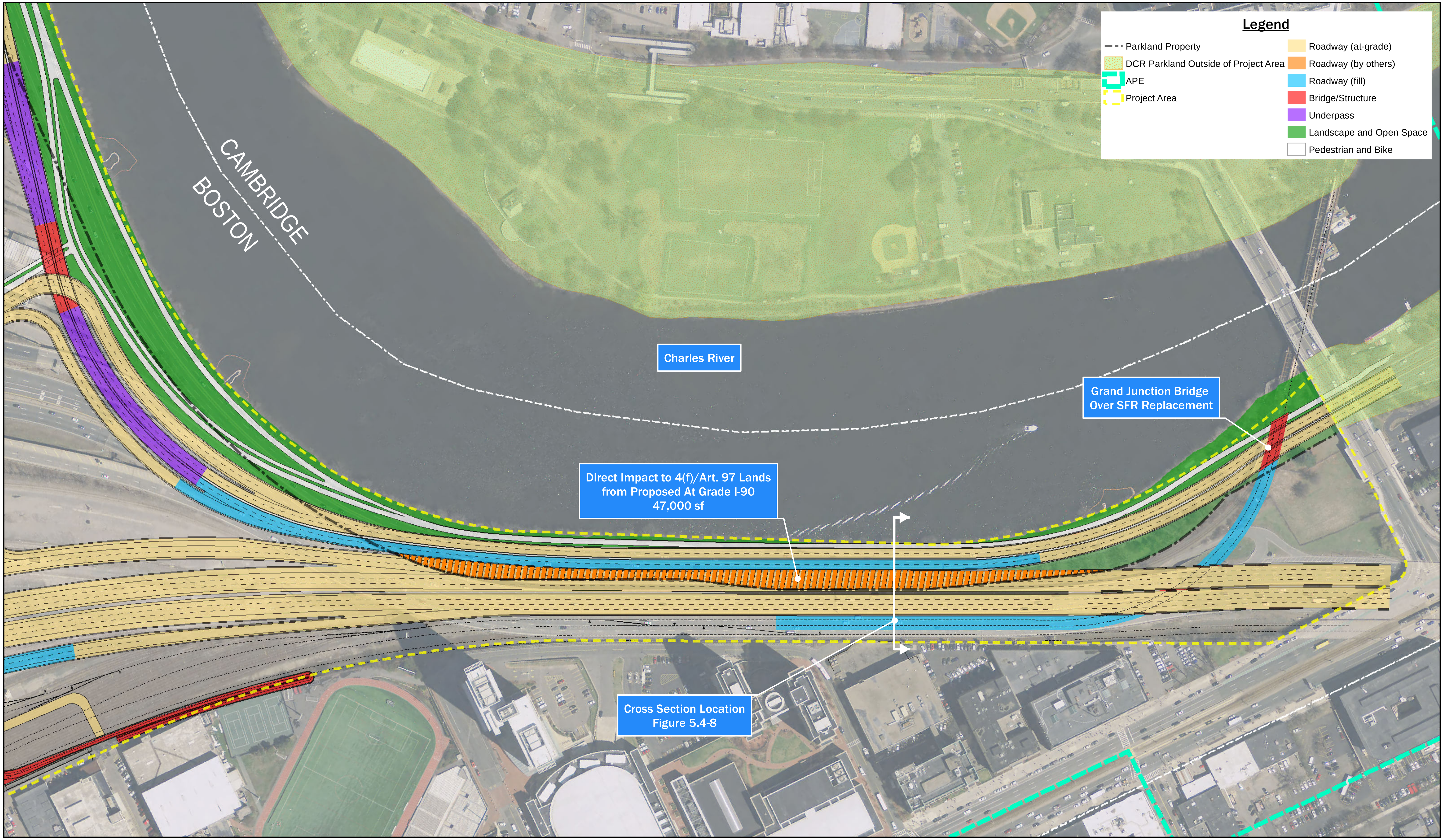
Parkland (Open Space) to be Transfered to DCR (1.16 Acres)

Parkland (Relocated SFR) to be Transfered to DCR (2.37 Acres)

Notes:
1. Compensation for impacts to Article 97 Land only includes land transferred to DCR

FIGURE 5.4-6

Article 97 / 4(f) Parkland Creation 3K-AMP


Legend
Parkland Property
DCR Parkland Outside of Project Area
APE
Project Area
Roadway (at-grade)
Roadway (by others)
Roadway (fill)
Bridge/Structure
Underpass
Landscape and Open Space
Pedestrian and Bike
CAMBRIDGE
BOSTON
Charles River
Grand Junction Bridge Over SFR Replacement
Direct Impact to 4(f)/Art. 97 Lands from Proposed At Grade I-90 47,000 sf
Cross Section Location Figure 5.4-8

INTERSTATE 90 ALLSTON INTERCHANGE

massDOT Massachusetts Department of Transportation Highway Division

0 100 200
Feet

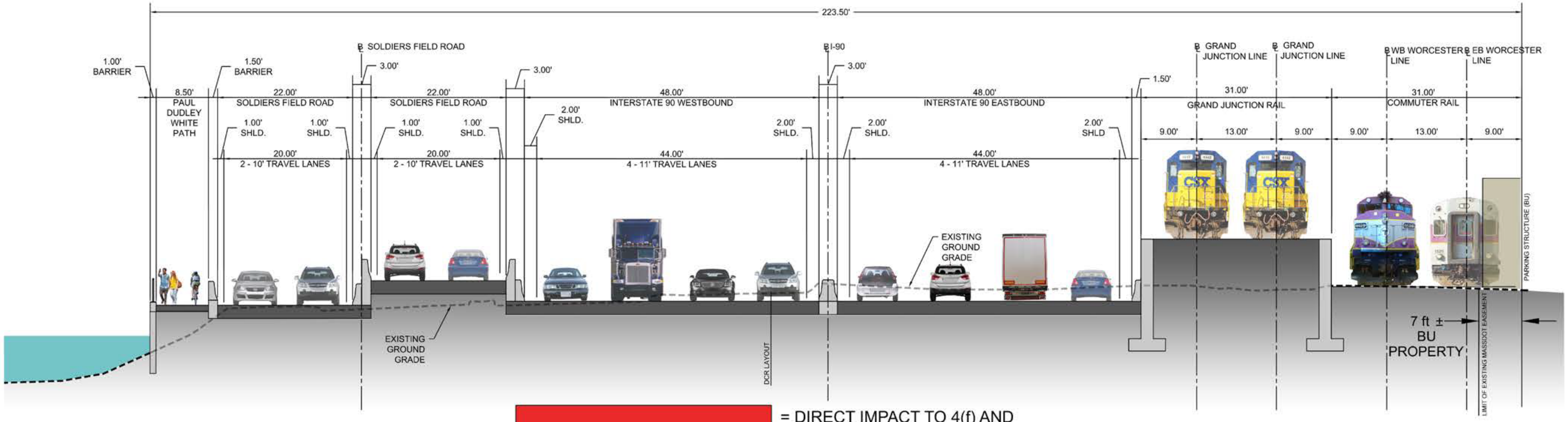
Notes:
1. APE - Area of Potential Effect
2. Boundary of 4(f), Article 97 and Historic Property is the Same

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE

3K-ABC Historic Resource and 4 (f)/Article 97 Impacts Throat Area

5.4-7


223.50'
1.00' BARRIER
1.50' BARRIER
℄ SOLDIERS FIELD ROAD
3.00'
3.00'
℄ I-90
3.00'
1.50'
℄ GRAND JUNCTION LINE
℄ GRAND JUNCTION LINE
℄ WB WORCESTER LINE
℄ EB WORCESTER LINE
8.50' PAUL DUDLEY WHITE PATH
22.00' SOLDIERS FIELD ROAD
22.00' SOLDIERS FIELD ROAD
48.00' INTERSTATE 90 WESTBOUND
48.00' INTERSTATE 90 EASTBOUND
31.00' GRAND JUNCTION RAIL
31.00' COMMUTER RAIL
1.00' SHLD.
1.00' SHLD.
1.00' SHLD.
1.00' SHLD.
2.00' SHLD.
2.00' SHLD.
2.00' SHLD.
2.00' SHLD
9.00'
13.00'
9.00'
9.00'
13.00'
9.00'
20.00' 2 - 10' TRAVEL LANES
20.00' 2 - 10' TRAVEL LANES
44.00' 4 - 11' TRAVEL LANES
44.00' 4 - 11' TRAVEL LANES
EXISTING GROUND GRADE
EXISTING GROUND GRADE
DCR LAYOUT
7 ft ± BU PROPERTY
LIMIT OF EXISTING MASSDOT EASEMENT
PARKING STRUCTURE (BU)

🟥 = DIRECT IMPACT TO 4(f) AND ARTICLE 97 LANDS

40' +/-

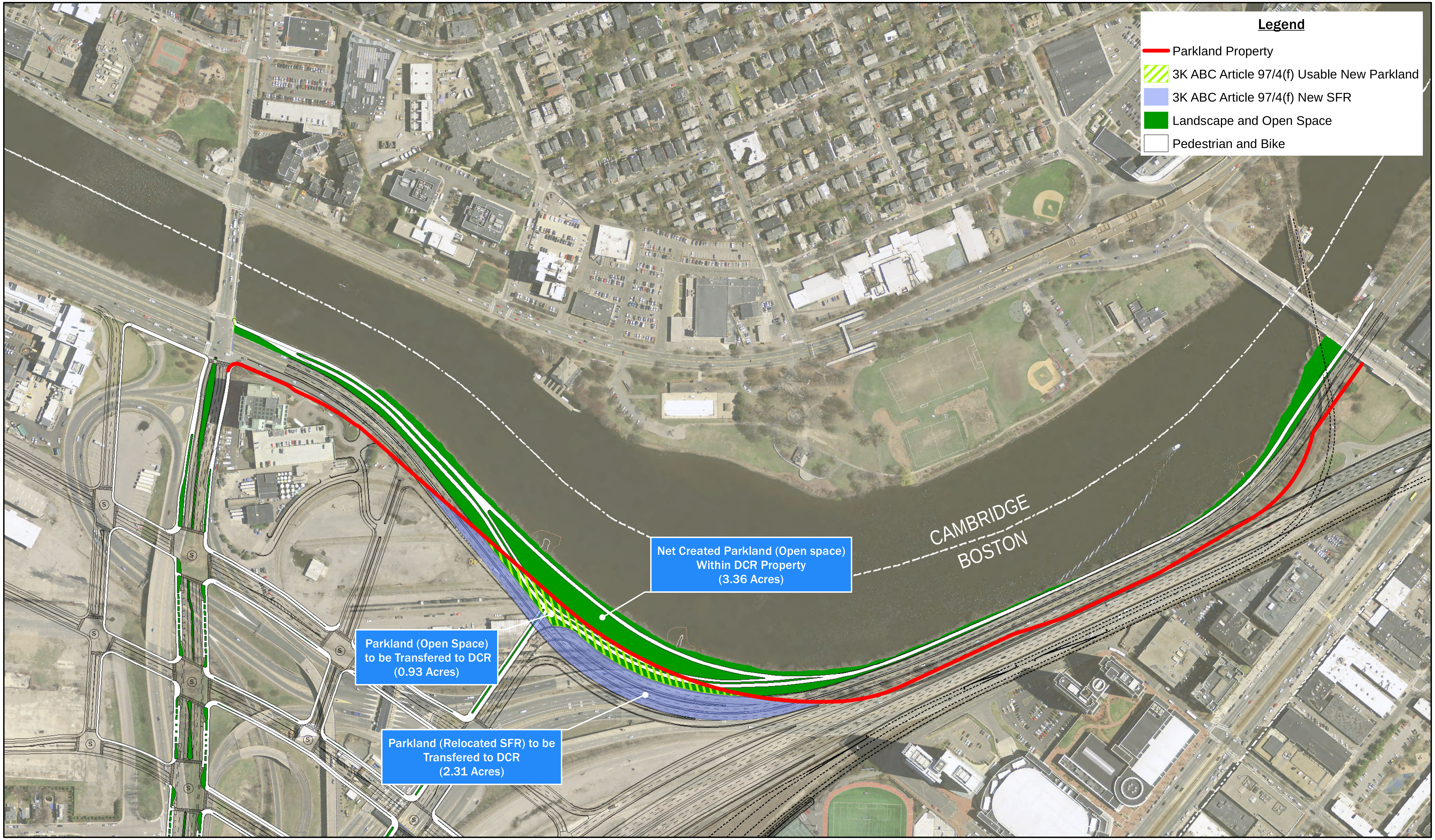
🟩 = EXISTING PUBLIC PARKLAND

95' +/-

FIGURE

4 (f) Land Impacts - 3K-ABC
Section View

5.4-8


Legend
Parkland Property
3K ABC Article 97/4(f) Usable New Parkland
3K ABC Article 97/4(f) New SFR
Landscape and Open Space
Pedestrian and Bike
CAMBRIDGE
BOSTON

Net Created Parkland (Open space) Within DCR Property (3.36 Acres)

Parkland (Open Space) to be Transfered to DCR (0.93 Acres)

Parkland (Relocated SFR) to be Transfered to DCR (2.31 Acres)

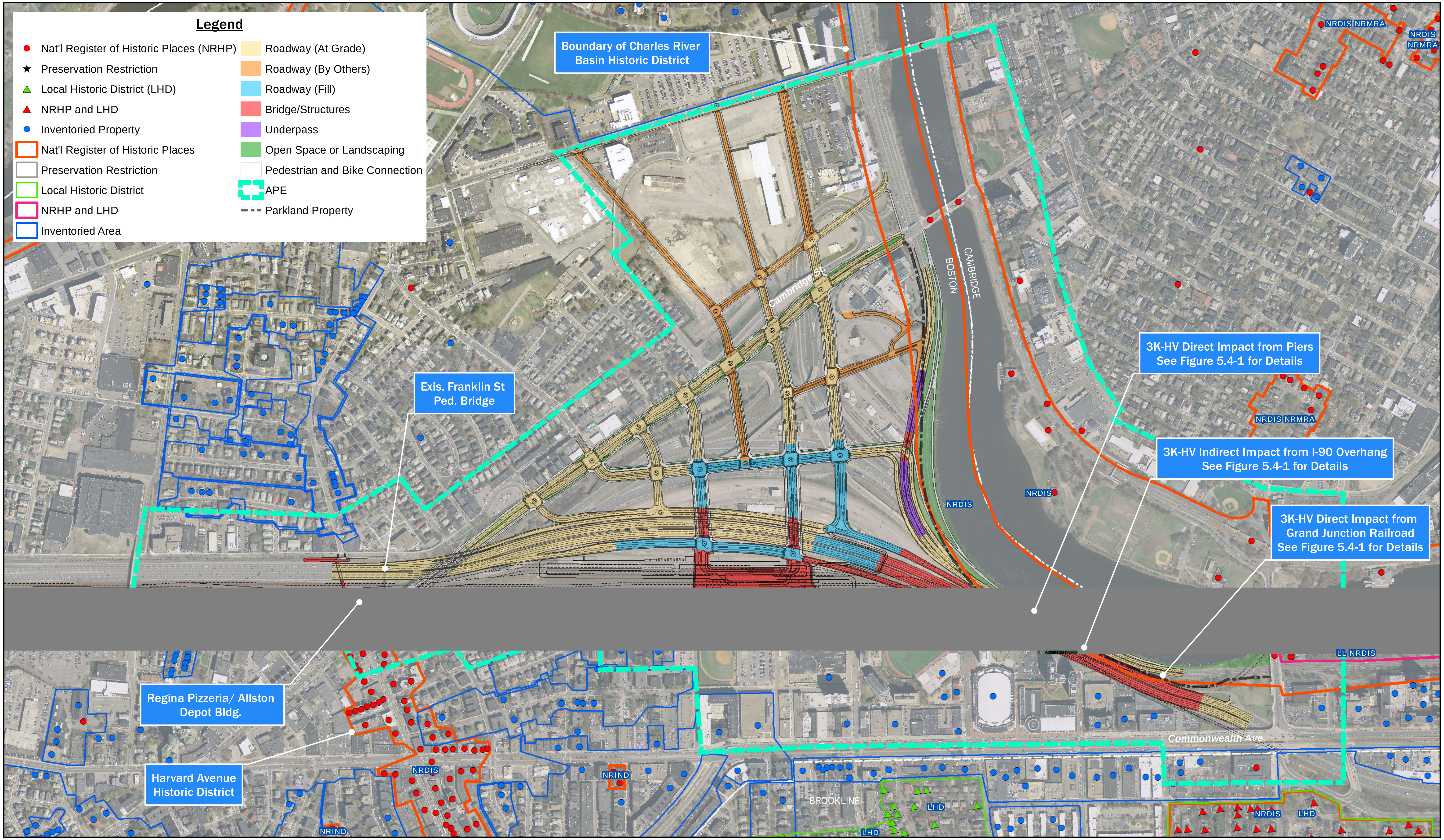
0
150
300
Feet

Notes:
1. Compensation for impacts to Article 97 Land only includes land transferred to DCR

I-90 Allston Interchange Project
Draft Environmental Impact Report

Article 97 / 4(f) Parkland Creation 3K-ABC

FIGURE
5.4-9


Legend
● Nat'l Register of Historic Places (NRHP)
★ Preservation Restriction
▲ Local Historic District (LHD)
▲ NRHP and LHD
● Inventoried Property
☐ Nat'l Register of Historic Places
☐ Preservation Restriction
☐ Local Historic District
☐ NRHP and LHD
☐ Inventoried Area
🟨 Roadway (At Grade)
🟧 Roadway (By Others)
🟦 Roadway (Fill)
🟥 Bridge/Structures
🟪 Underpass
🟩 Open Space or Landscaping
☐ Pedestrian and Bike Connection
▭ APE
--- Parkland Property
Boundary of Charles River Basin Historic District
Exis. Franklin St Ped. Bridge
3K-HV Direct Impact from Piers See Figure 5.4-1 for Details
3K-HV Indirect Impact from I-90 Overhang See Figure 5.4-1 for Details
3K-HV Direct Impact from Grand Junction Railroad See Figure 5.4-1 for Details
Regina Pizzeria/ Allston Depot Bldg.
Harvard Avenue Historic District
Cambridge St
BOSTON
CAMBRIDGE
NRDIS
NRMRA
NRDIS NRMRA
NRIND
LL NRDIS
LHD
Commonwealth Ave.
BROOKLINE

N

0 300 600
Feet

Notes:
1. Source: MassGIS/MHC Historic Data
2. APE - Area of Potential Effect

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3K-HV Historic Resource Impacts

FIGURE
5.6-1

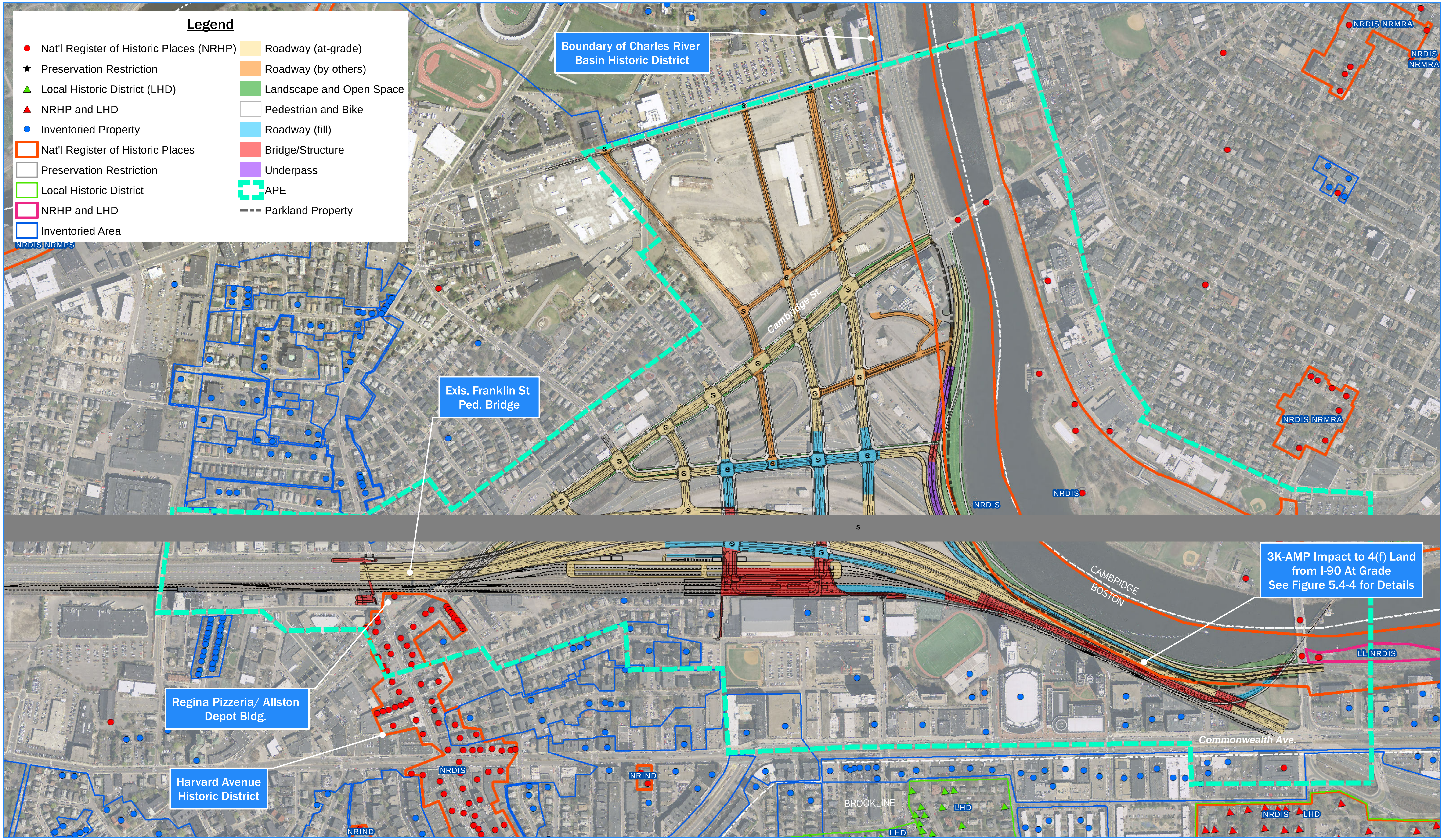
Legend
● Nat'l Register of Historic Places (NRHP)
★ Preservation Restriction
▲ Local Historic District (LHD)
▲ NRHP and LHD
● Inventoried Property
☐ Nat'l Register of Historic Places
☐ Preservation Restriction
☐ Local Historic District
☐ NRHP and LHD
☐ Inventoried Area
🟨 Roadway (at-grade)
🟧 Roadway (by others)
🟩 Landscape and Open Space
☐ Pedestrian and Bike
🟦 Roadway (fill)
🟥 Bridge/Structure
🟪 Underpass
APE
Parkland Property
Boundary of Charles River Basin Historic District
Exis. Franklin St Ped. Bridge
Regina Pizzeria/ Allston Depot Bldg.
Harvard Avenue Historic District
3K-AMP Impact to 4(f) Land from I-90 At Grade See Figure 5.4-4 for Details
Cambridge St.
Commonwealth Ave.
CAMBRIDGE
BOSTON
BROOKLINE
NRDIS NRMPS
NRDIS NRMRA
NRDIS
NRIND
LL NRDIS
NRDIS LHD
LHD
S

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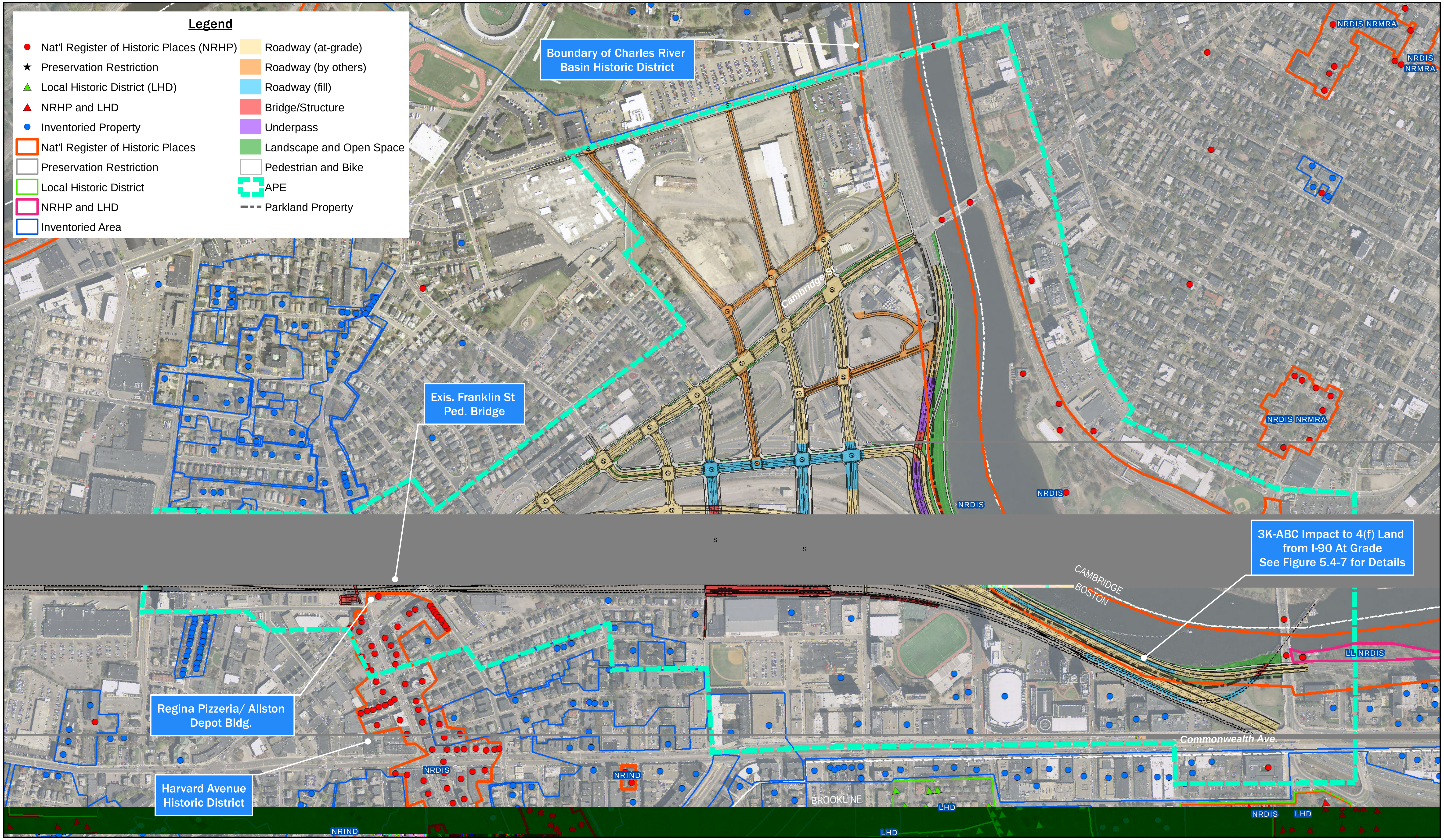
FIGURE

3K-AMP Historic Resource Impacts

5.6-2

0 300 600
Feet

Notes:
1. Source: MassGIS/MHC Historic Data
2. APE - Area of Potential Effect


Legend
● Nat'l Register of Historic Places (NRHP)
★ Preservation Restriction
▲ Local Historic District (LHD)
▲ NRHP and LHD
● Inventoried Property
▢ Nat'l Register of Historic Places
▢ Preservation Restriction
▢ Local Historic District
▢ NRHP and LHD
▢ Inventoried Area
▨ Roadway (at-grade)
▨ Roadway (by others)
▨ Roadway (fill)
▨ Bridge/Structure
▨ Underpass
▨ Landscape and Open Space
▢ Pedestrian and Bike
▢ APE
--- Parkland Property
Boundary of Charles River Basin Historic District
Exis. Franklin St Ped. Bridge
3K-ABC Impact to 4(f) Land from I-90 At Grade See Figure 5.4-7 for Details
Regina Pizzeria/ Allston Depot Bldg.
Harvard Avenue Historic District
Cambridge St
CAMBRIDGE
BOSTON
Commonwealth Ave.
BROOKLINE
NRDIS NRMRA
NRDIS
NRMRA
NRDIS
LL NRDIS
NRIND
LHD

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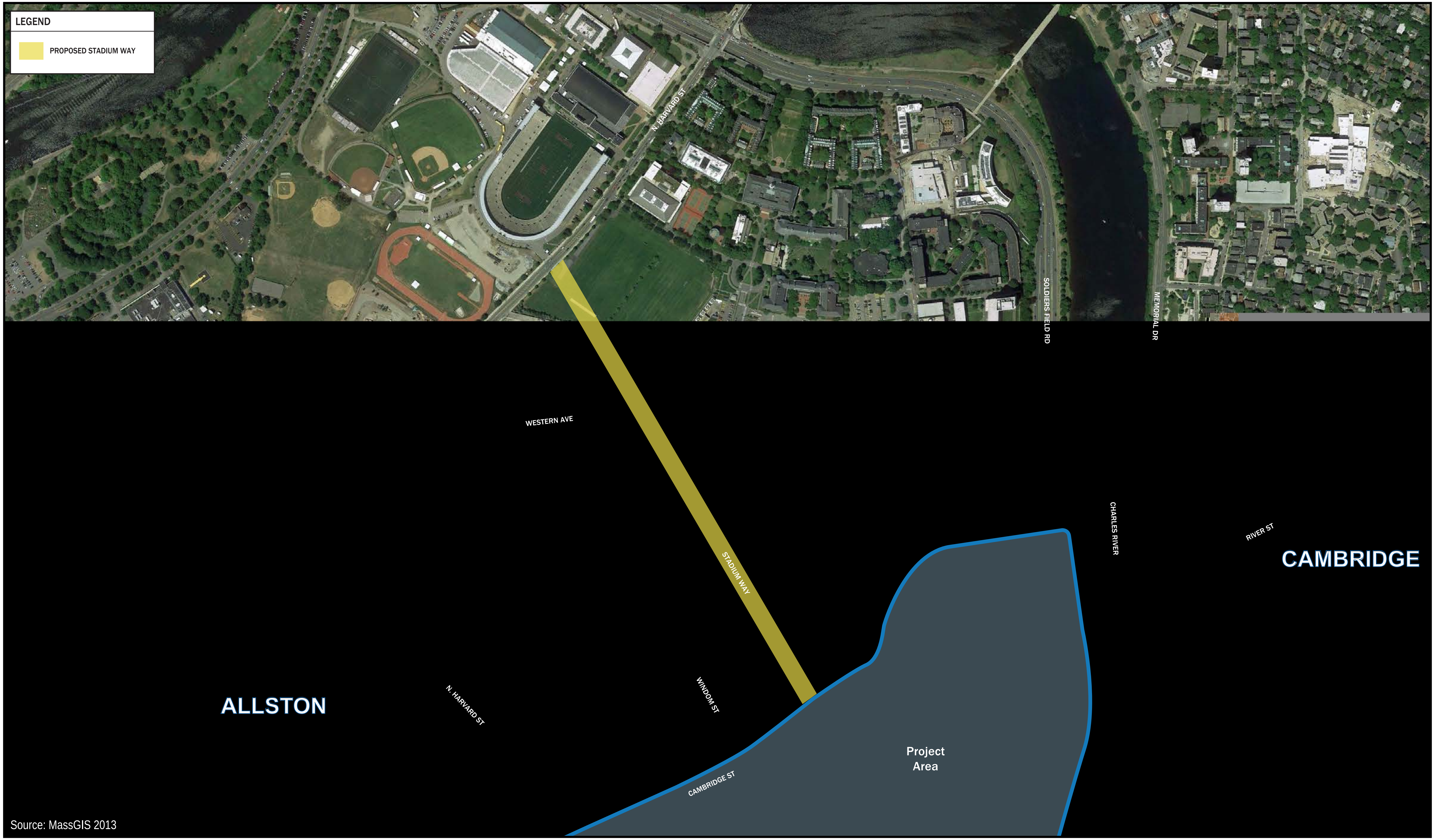
0 300 600
Feet

Notes:
1. Source: MassGIS/MHC Historic Data
2. APE - Area of Potential Effect

3K-ABC Historic Resource Impacts

FIGURE
5.6-3


LEGEND
PROPOSED STADIUM WAY
N. HARVARD ST
SOLDIERS FIELD RD
MEMORIAL DR
WESTERN AVE
STADIUM WAY
CHARLES RIVER
RIVER ST
CAMBRIDGE
ALLSTON
N. HARVARD ST
WINDOM ST
Project Area
CAMBRIDGE ST
N
0
200
400
Feet

Source: MassGIS 2013

INTERSTATE 90 ALLSTON INTERCHANGE

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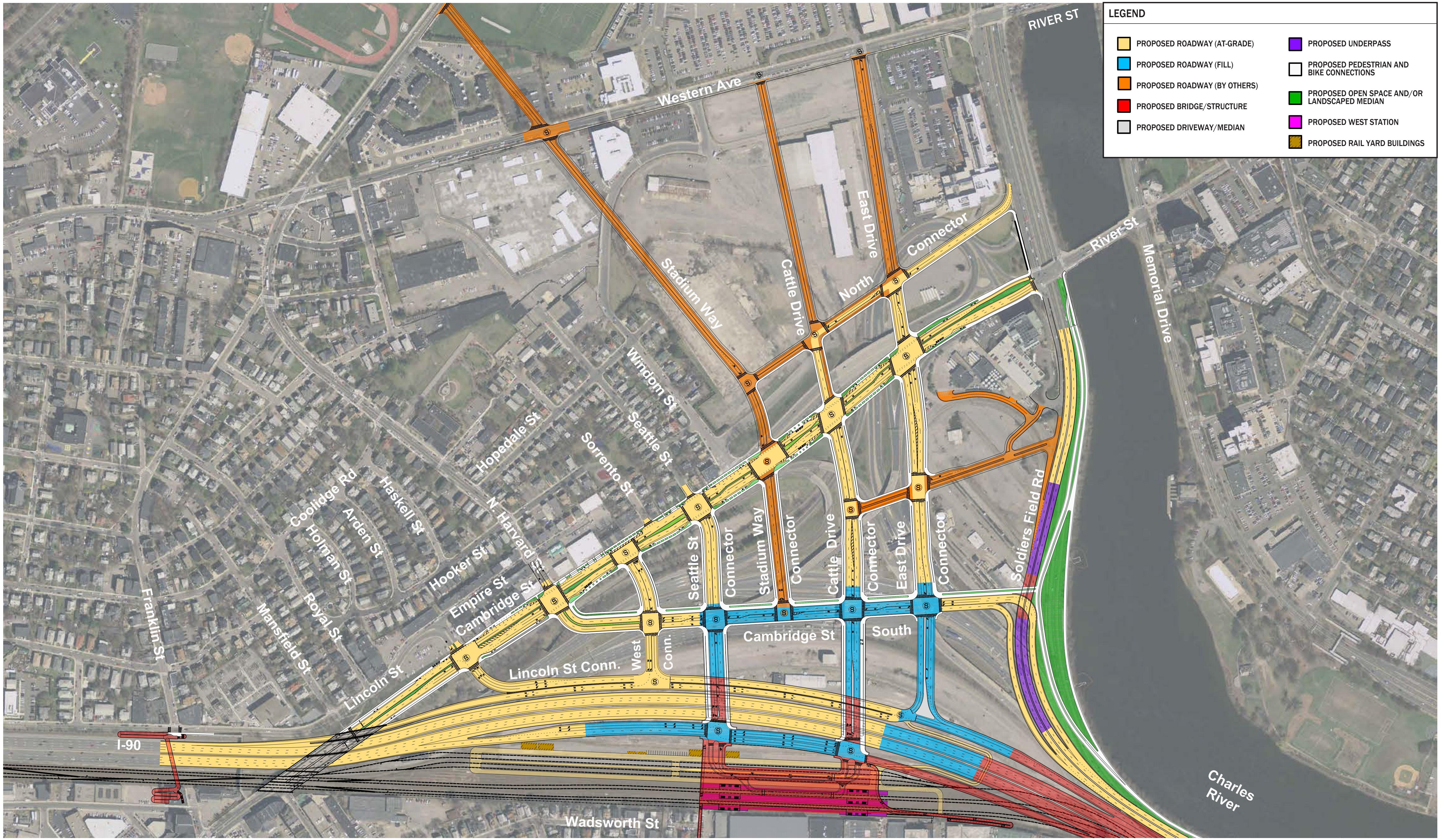
Draft Environmental Impact Report

FIGURE
5.8-1

Proposed Stadium Way Alignment


LEGEND
🟨 PROPOSED ROADWAY (AT-GRADE)
🟦 PROPOSED ROADWAY (FILL)
🟧 PROPOSED ROADWAY (BY OTHERS)
🟥 PROPOSED BRIDGE/STRUCTURE
⬜ PROPOSED DRIVEWAY/MEDIAN
🟪 PROPOSED UNDERPASS
☐ PROPOSED PEDESTRIAN AND BIKE CONNECTIONS
🟩 PROPOSED OPEN SPACE AND/OR LANDSCAPED MEDIAN
■ PROPOSED WEST STATION
■ PROPOSED RAIL YARD BUILDINGS
RIVER ST
Western Ave
River St
Memorial Drive
Connector
North
East Drive
Cattle Drive
Stadium Way
Windom St
Seattle St
Sorrento St
Hopedale St
N. Harvard St
Haskell St
Coolidge Rd
Arden St
Holman St
Hooker St
Empire St
Cambridge St
Royal St
Mansfield St
Franklin St
Lincoln St
Lincoln St Conn.
West
Conn.
Seattle St
Connector
Stadium Way
Connector
Cattle Drive
Connector
East Drive
Connector
Soldiers Field Rd
Cambridge St
South
I-90
Wadsworth St
Charles River

Approximate Scale in Feet

400 0 100 200 400

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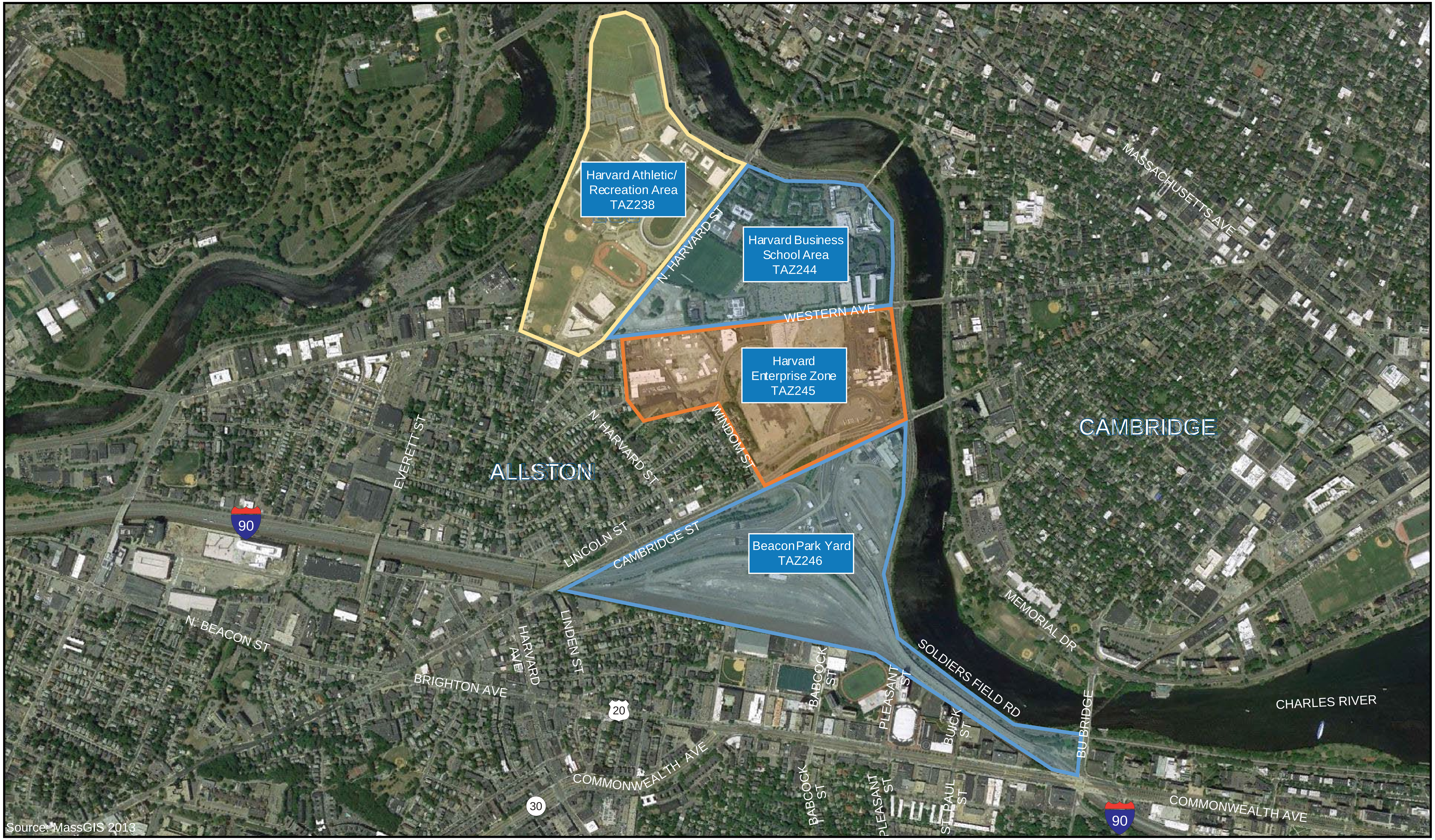
FIGURE
5.8-2

2040 Design Year
8 U E D Q Interchange Alternative 3K


Harvard Athletic/
Recreation Area
TAZ238
Harvard Business
School Area
TAZ244
Harvard
Enterprise Zone
TAZ245
Beacon Park Yard
TAZ246
N. HARVARD ST
WESTERN AVE
MASSACHUSETTS AVE
CAMBRIDGE
ALLSTON
EVERETT ST
N. HARVARD ST
WINDOM ST
LINCOLN ST
CAMBRIDGE ST
90
N. BEACON ST
HARVARD AVE
LINDEN ST
BRIGHTON AVE
20
COMMONWEALTH AVE
30
BABCOCK ST
PLEASANT ST
BUICK ST
ST PAUL ST
SOLDIERS FIELD RD
MEMORIAL DR
BU BRIDGE
CHARLES RIVER
COMMONWEALTH AVE
90

Source: MassGIS 2013

0 500 1000
Feet

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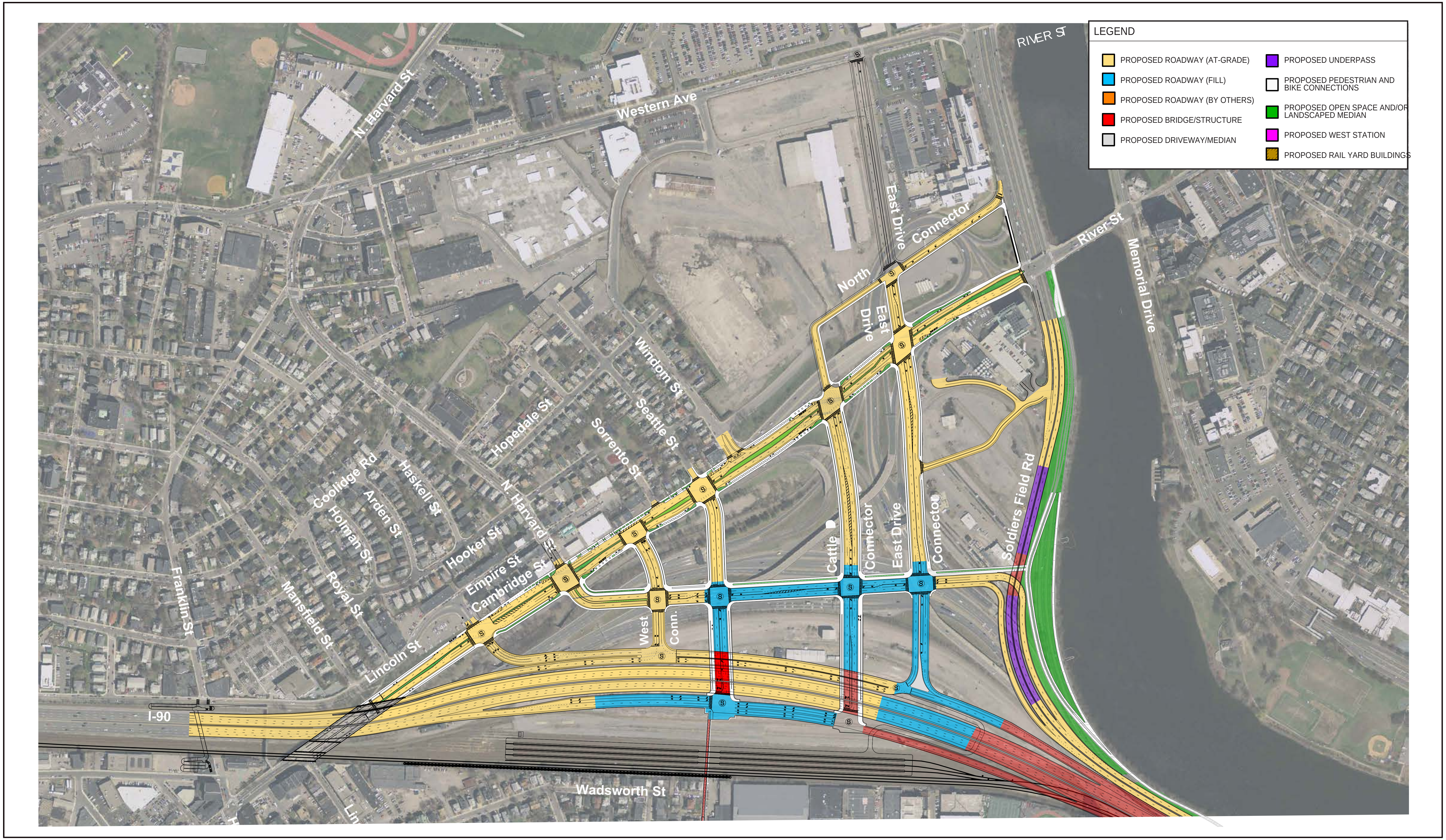
FIGURE

. -

Project Area
Traffic Analysis Zones (TAZ)


RIVER ST
Western Ave
N. Harvard St
East Drive
Connector
North
East Drive
River St
Memorial Drive
Windom St
Seattle St
Sorrento St
Hopedale St
Coolidge Rd
Haskell St
Arden St
Holman St
N. Harvard
Hooker St
Empire St
Cambridge St
Royal St
Mansfield St
Franklin St
Lincoln St
West
Conn.
Cattle
Connector
East Drive
Connector
Soldiers Field Rd
I-90
Wadsworth St
S

LEGEND

- 🟨 PROPOSED ROADWAY (AT-GRADE)
- 🟦 PROPOSED ROADWAY (FILL)
- 🟧 PROPOSED ROADWAY (BY OTHERS)
- 🟥 PROPOSED BRIDGE/STRUCTURE
- ⬜ PROPOSED DRIVEWAY/MEDIAN
- 🟪 PROPOSED UNDERPASS
- ☐ PROPOSED PEDESTRIAN AND BIKE CONNECTIONS
- 🟩 PROPOSED OPEN SPACE AND/OR LANDSCAPED MEDIAN
- 🟪 PROPOSED WEST STATION
- 🟫 PROPOSED RAIL YARD BUILDINGS

400 0 100 200 400

Approximate Scale in Feet

N

INTERSTATE 90 ALLSTON INTERCHANGE

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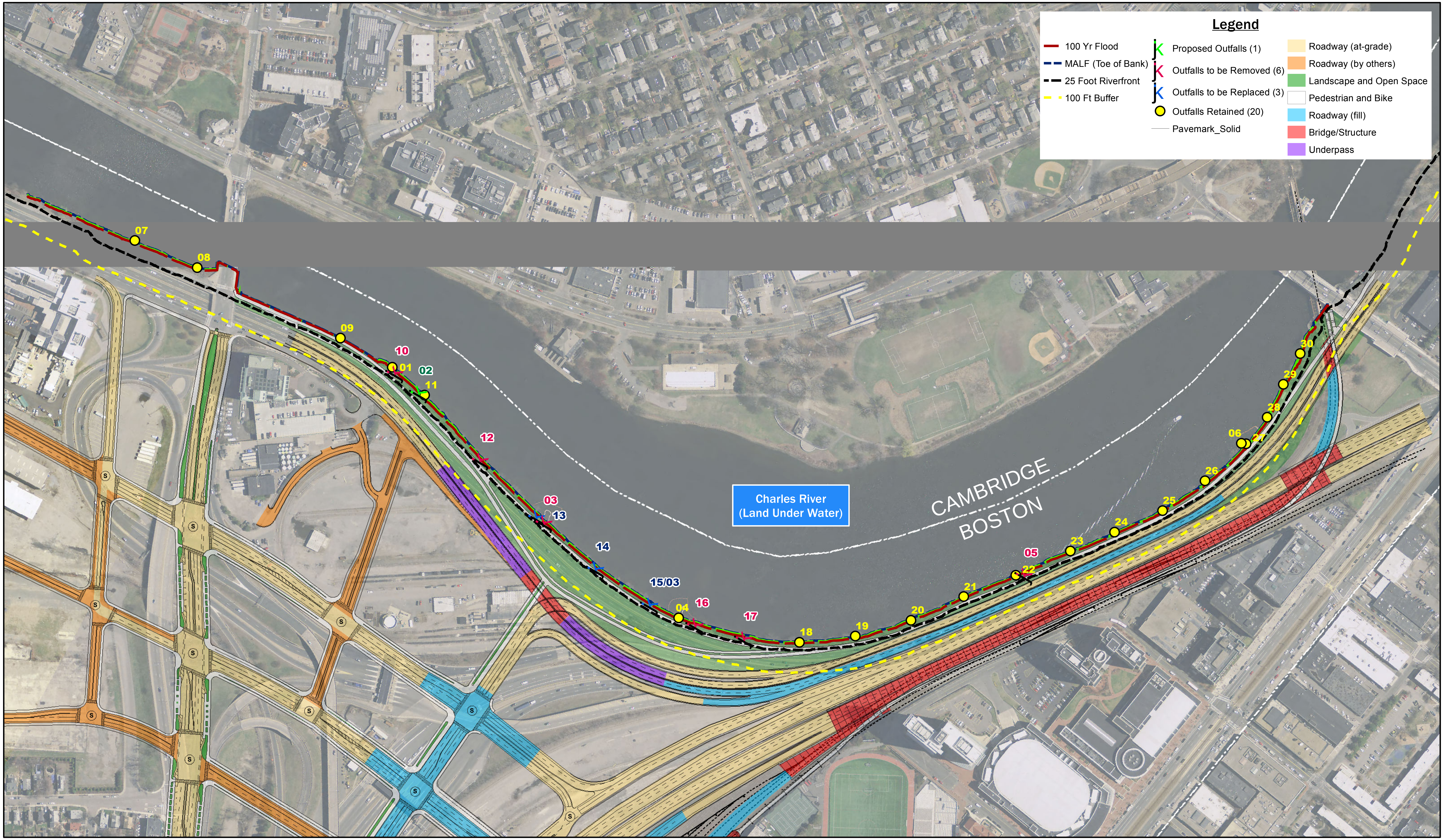
FIGURE . -

2025 Opening Year
8 U E D Q Interc K D Q J H Alternative 3K


Legend
100 Yr Flood
MALF (Toe of Bank)
25 Foot Riverfront
100 Ft Buffer
Proposed Outfalls (1)
Outfalls to be Removed (6)
Outfalls to be Replaced (3)
Outfalls Retained (20)
Pavemark_Solid
Roadway (at-grade)
Roadway (by others)
Landscape and Open Space
Pedestrian and Bike
Roadway (fill)
Bridge/Structure
Underpass
Charles River
(Land Under Water)
CAMBRIDGE
BOSTON
07
08
09
10
01
02
11
12
03
13
14
15/03
16
04
17
18
19
20
21
05
22
23
24
25
26
06
27
28
29
30

0 150 300
Feet

Note:
1. Wetland Impact from Outfalls (Associated with Preferred Alternative)
- LUW Impacts 200 sf Temp/40 sf Perm
- Bank Impacts 80 lf Temp/10 lf Perm

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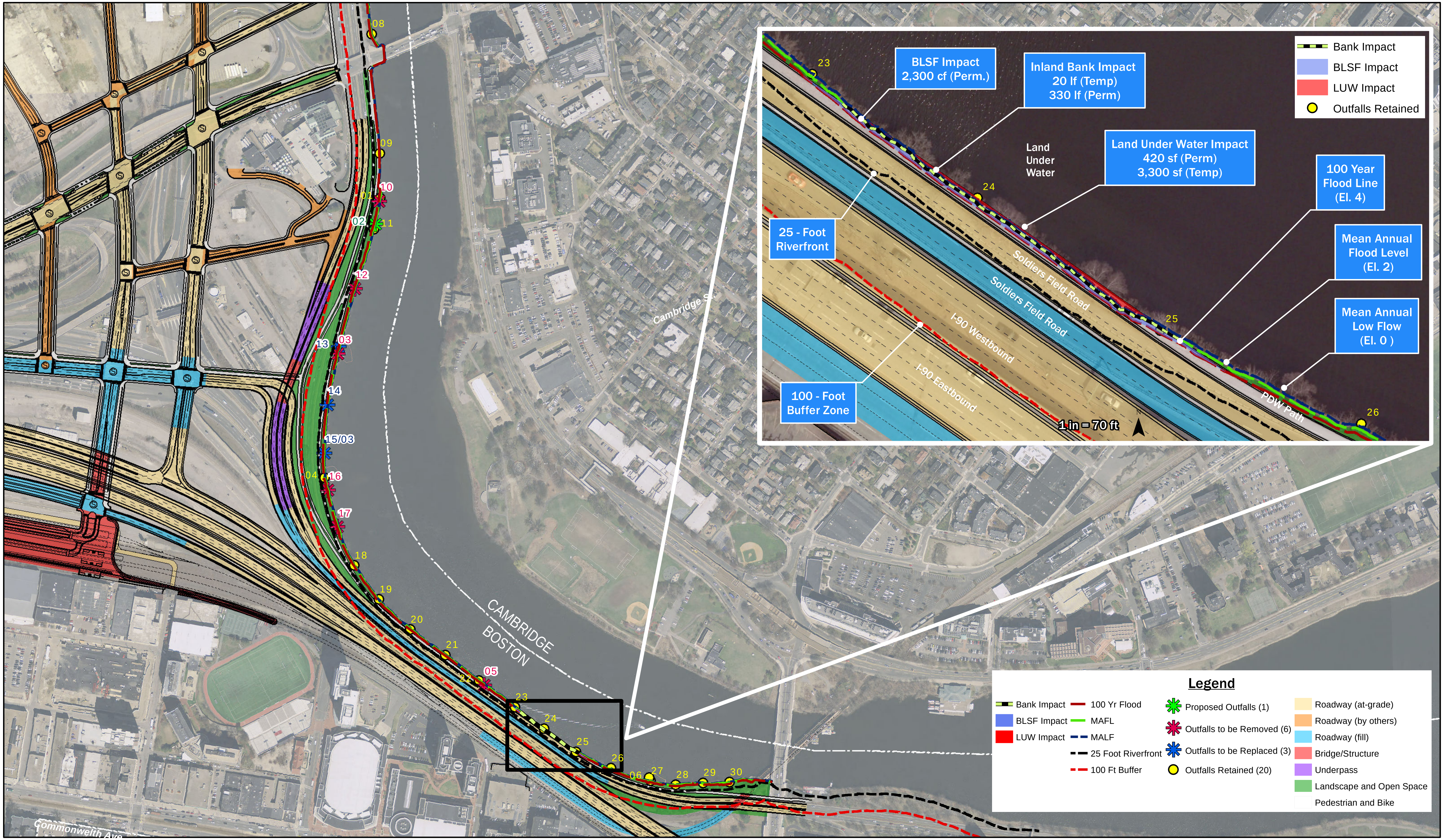
Wetland Impacts
3K-AMP

FIGURE
5 12 2


BLSF Impact
2,300 cf (Perm.)
Inland Bank Impact
20 lf (Temp)
330 lf (Perm)
Land Under Water
Land Under Water Impact
420 sf (Perm)
3,300 sf (Temp)
100 Year Flood Line (El. 4)
Mean Annual Flood Level (El. 2)
Mean Annual Low Flow (El. 0)
25 - Foot Riverfront
100 - Foot Buffer Zone
Soldiers Field Road
Soldiers Field Road
I-90 Westbound
I-90 Eastbound
PDW Path
1 in = 70 ft
23
24
25
26
Bank Impact
BLSF Impact
LUW Impact
Outfalls Retained
CAMBRIDGE
BOSTON
Cambridge St
Commonwealth Ave
08
09
10
01
02
11
12
13
03
14
15/03
04
16
17
18
19
20
21
05
22
06
27
28
29
30
Legend
Bank Impact
BLSF Impact
LUW Impact
100 Yr Flood
MAFL
MALF
25 Foot Riverfront
100 Ft Buffer
Proposed Outfalls (1)
Outfalls to be Removed (6)
Outfalls to be Replaced (3)
Outfalls Retained (20)
Roadway (at-grade)
Roadway (by others)
Roadway (fill)
Bridge/Structure
Underpass
Landscape and Open Space
Pedestrian and Bike

INTERSTATE 90 ALLSTON INTERCHANGE

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N

0 200 400
Feet

1. Wetland Impact from Outfalls (Associated with Preferred Alternative)
   - LUW Impacts 200 sf Temp/40 sf Perm
   - Bank Impacts 80 lf Temp/10 lf Perm
2. Permanent Wetland Alterations Shown are Associated with Retaining Wall and Fill
3. Temporary Wetland Impacts Not Shown on Plan

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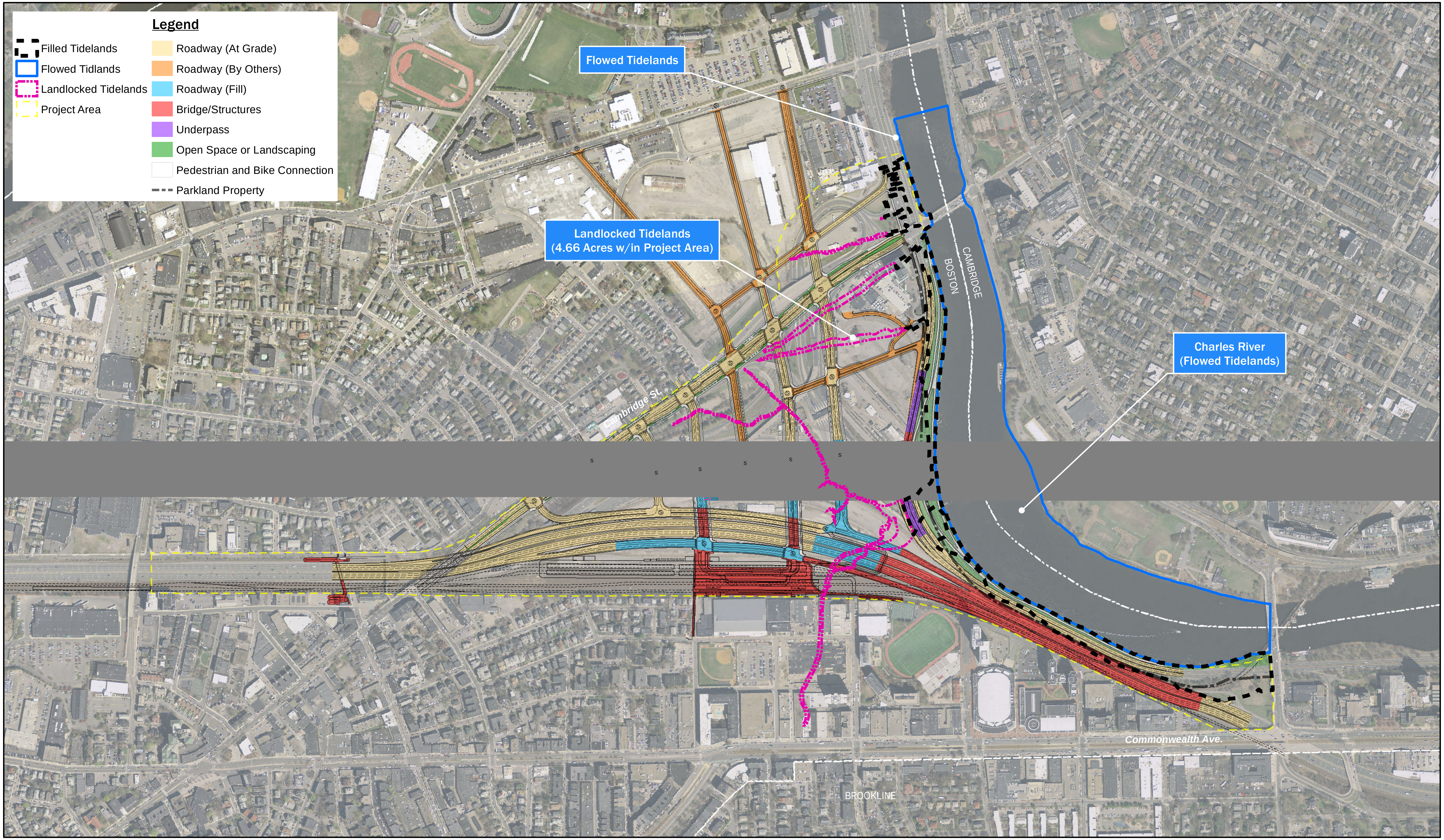
FIGURE

Wetland Impacts
3K-ABC

5.12-3


Legend
Filled Tidelands
Flowed Tidlands
Landlocked Tidelands
Project Area
Roadway (At Grade)
Roadway (By Others)
Roadway (Fill)
Bridge/Structures
Underpass
Open Space or Landscaping
Pedestrian and Bike Connection
Parkland Property
Flowed Tidelands
Landlocked Tidelands (4.66 Acres w/in Project Area)
Charles River (Flowed Tidelands)
CAMBRIDGE
BOSTON
Cambridge St.
Commonwealth Ave.
BROOKLINE
N
0
300
600
Feet

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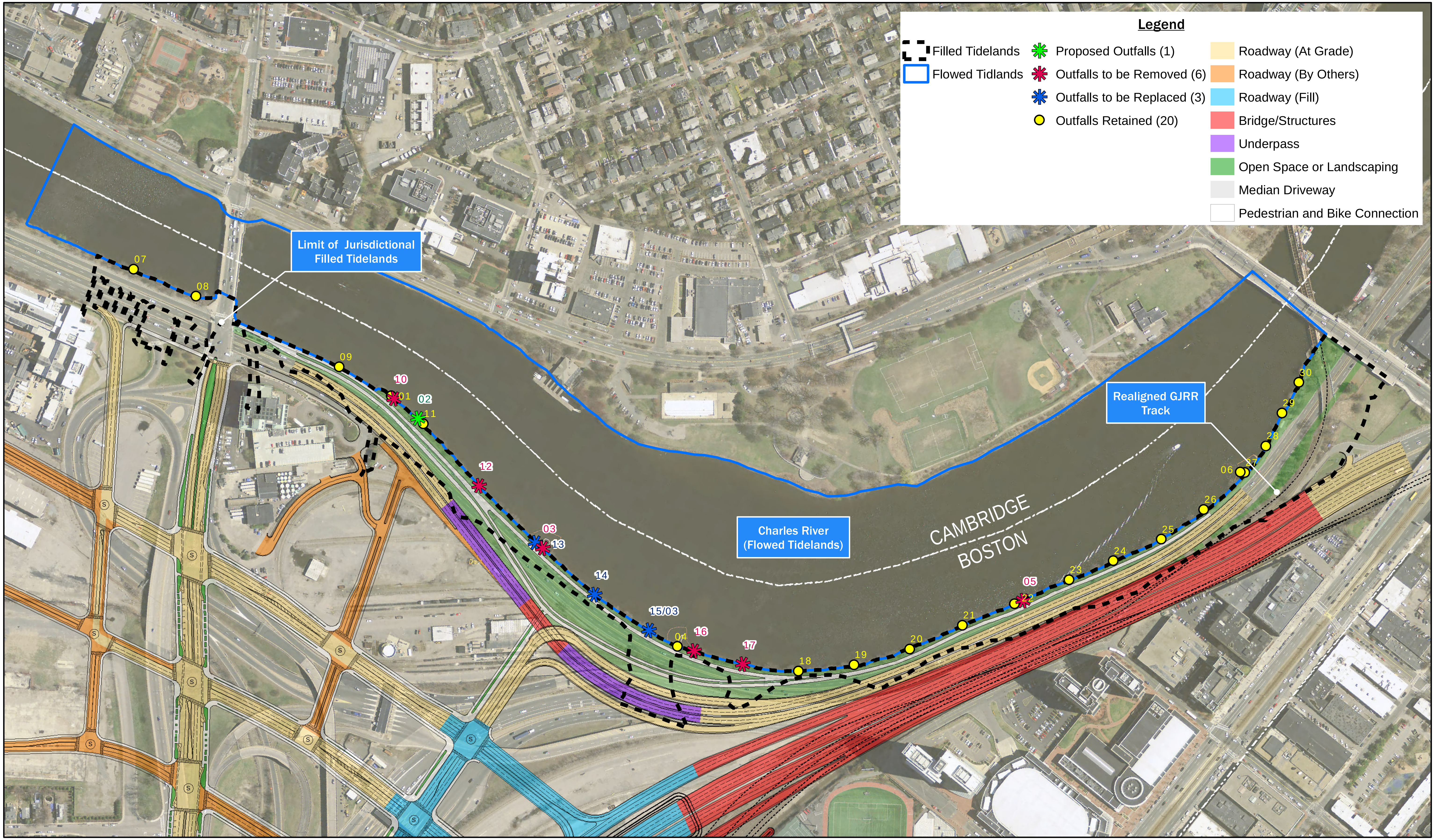
Notes:
1. Impacts to Landlocked Tidelands are the same for all Variations and only shown on this Figure
2. Total Area of Landlocked Tidelands in Project Area 4.66 Acres
3. 3K-HV Variation shown on plan is not part of Preferred Alternative

FIGURE 5.12-4

Chapter 91 Impacts Preferred Alternative


Legend
Filled Tidelands
Flowed Tidlands
Proposed Outfalls (1)
Outfalls to be Removed (6)
Outfalls to be Replaced (3)
Outfalls Retained (20)
Roadway (At Grade)
Roadway (By Others)
Roadway (Fill)
Bridge/Structures
Underpass
Open Space or Landscaping
Median Driveway
Pedestrian and Bike Connection
Limit of Jurisdictional Filled Tidelands
Charles River (Flowed Tidelands)
Realigned GJRR Track
CAMBRIDGE
BOSTON
07
08
09
10
01
02
11
12
03
13
14
15/03
04
16
17
18
19
20
21
05
22
23
24
25
26
06
27
28
29
30
0 150 300
Feet

Notes:

1. Flowed Tidelands Impact from Outfalls (Associated with Preferred Alternative)
   - 200 sf Temp/60 sf Perm

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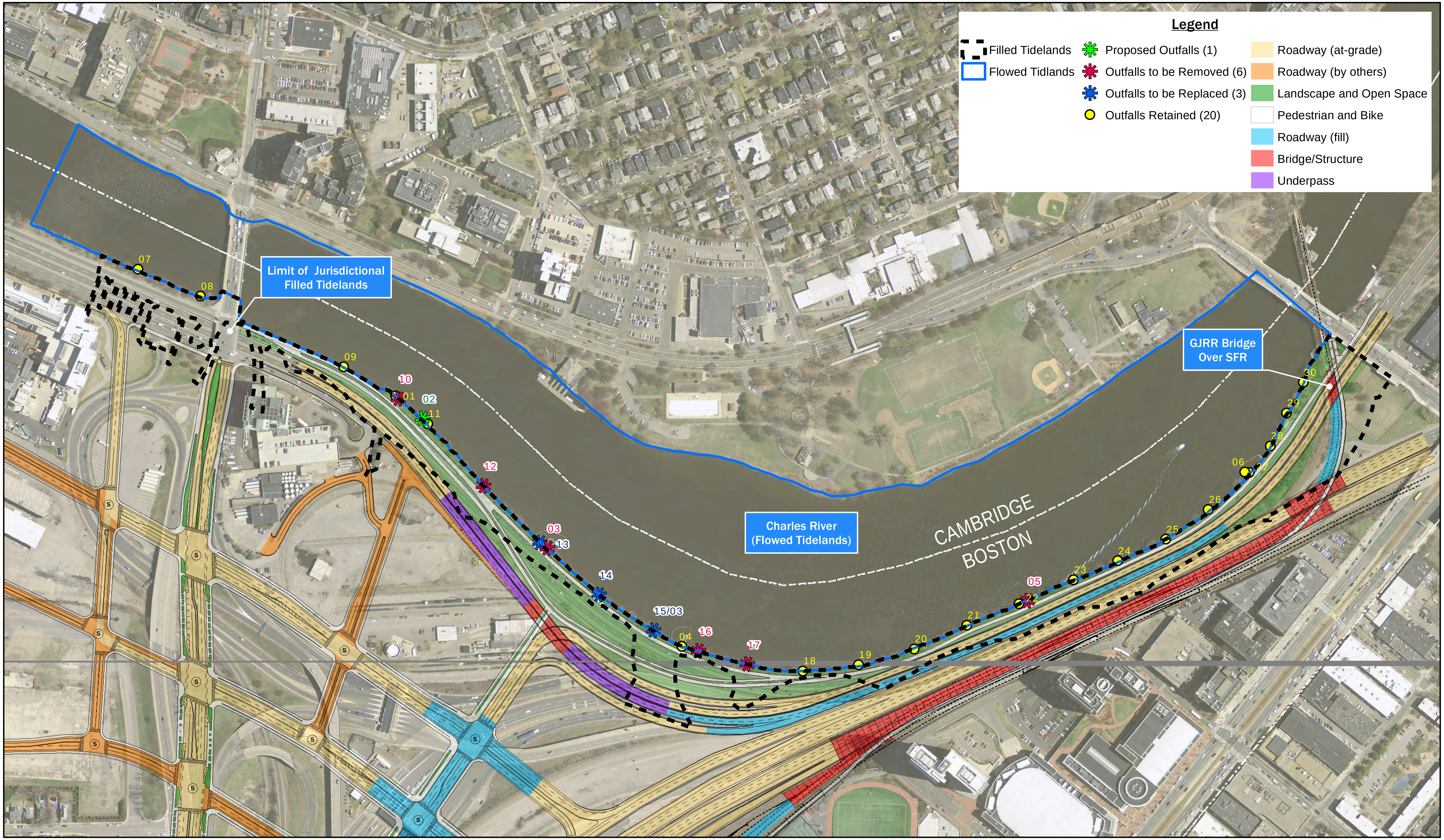
FIGURE

Chapter 91 Impacts
3K-HV

5.12-5


Legend
Filled Tidelands
Flowed Tidlands
Proposed Outfalls (1)
Outfalls to be Removed (6)
Outfalls to be Replaced (3)
Outfalls Retained (20)
Roadway (at-grade)
Roadway (by others)
Landscape and Open Space
Pedestrian and Bike
Roadway (fill)
Bridge/Structure
Underpass
Limit of Jurisdictional Filled Tidelands
Charles River (Flowed Tidelands)
GJRR Bridge Over SFR
CAMBRIDGE
BOSTON
07
08
09
10
01
02
11
12
03
13
14
15/03
04
16
17
18
19
20
21
05
22
23
24
25
26
06
27
28
29
30

INTERSTATE 90
ALLSTON
INTERCHANGE

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Massachusetts Department of Transportation
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0 150 300
Feet

Notes:
1. Flowed Tidelands Impact from Outfalls (Associated with Preferred Alternative)
- 200 sf Temp/60 sf Perm

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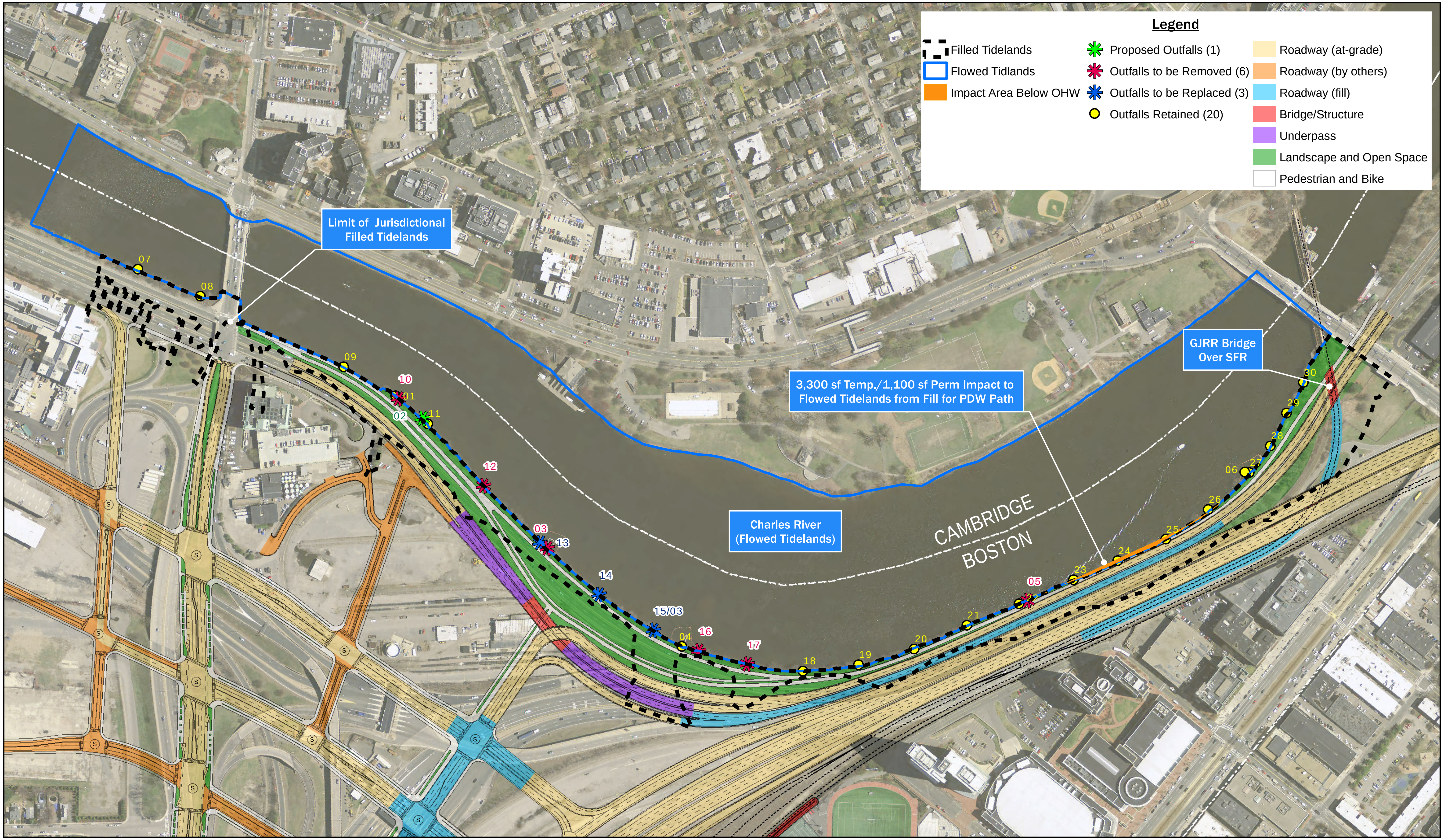
Chapter 91 Impacts
3K-AMP

FIGURE
5.12-6


Legend
Filled Tidelands
Flowed Tidlands
Impact Area Below OHW
Proposed Outfalls (1)
Outfalls to be Removed (6)
Outfalls to be Replaced (3)
Outfalls Retained (20)
Roadway (at-grade)
Roadway (by others)
Roadway (fill)
Bridge/Structure
Underpass
Landscape and Open Space
Pedestrian and Bike
Limit of Jurisdictional Filled Tidelands
GJRR Bridge Over SFR
3,300 sf Temp./1,100 sf Perm Impact to Flowed Tidelands from Fill for PDW Path
Charles River (Flowed Tidelands)
CAMBRIDGE
BOSTON
07
08
09
10
01
02
11
12
03
13
14
15/03
04
16
17
18
19
20
21
05
22
23
24
25
26
06
27
28
29
30
S

0
150
300
Feet

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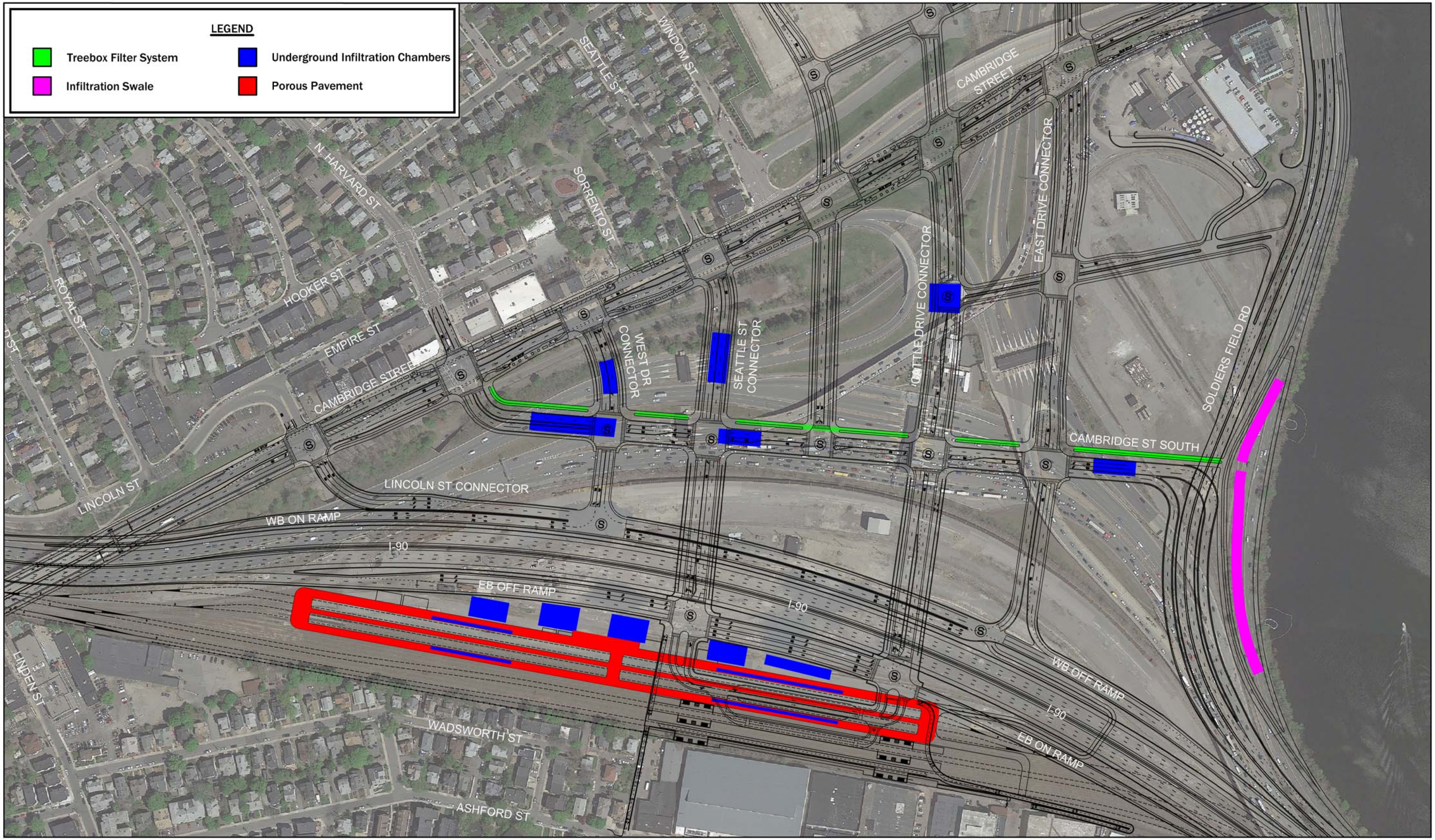
Notes:
1. Flowed Tidelands Impact from Outfalls (Associated with Preferred Alternative)
- 200 sf Temp/60 sf Perm

FIGURE

Chapter 91 Impacts
3K-ABC

5.12-7


LEGEND
🟩 Treebox Filter System
🟦 Underground Infiltration Chambers
🟪 Infiltration Swale
🟥 Porous Pavement
SEATTLE ST
WINDOM ST
N HARVARD ST
SORRENTO ST
ROYAL ST
D ST
HOOKER ST
EMPIRE ST
CAMBRIDGE STREET
CAMBRIDGE STREET
EAST DRIVE CONNECTOR
CATTLE DRIVE CONNECTOR
SEATTLE ST CONNECTOR
WEST DR CONNECTOR
SOLDIERS FIELD RD
CAMBRIDGE ST SOUTH
LINCOLN ST
LINCOLN ST CONNECTOR
WB ON RAMP
I-90
EB OFF RAMP
I-90
WB OFF RAMP
I-90
EB ON RAMP
LINDEN ST
WADSWORTH ST
ASHFORD ST

0 125 250
Feet

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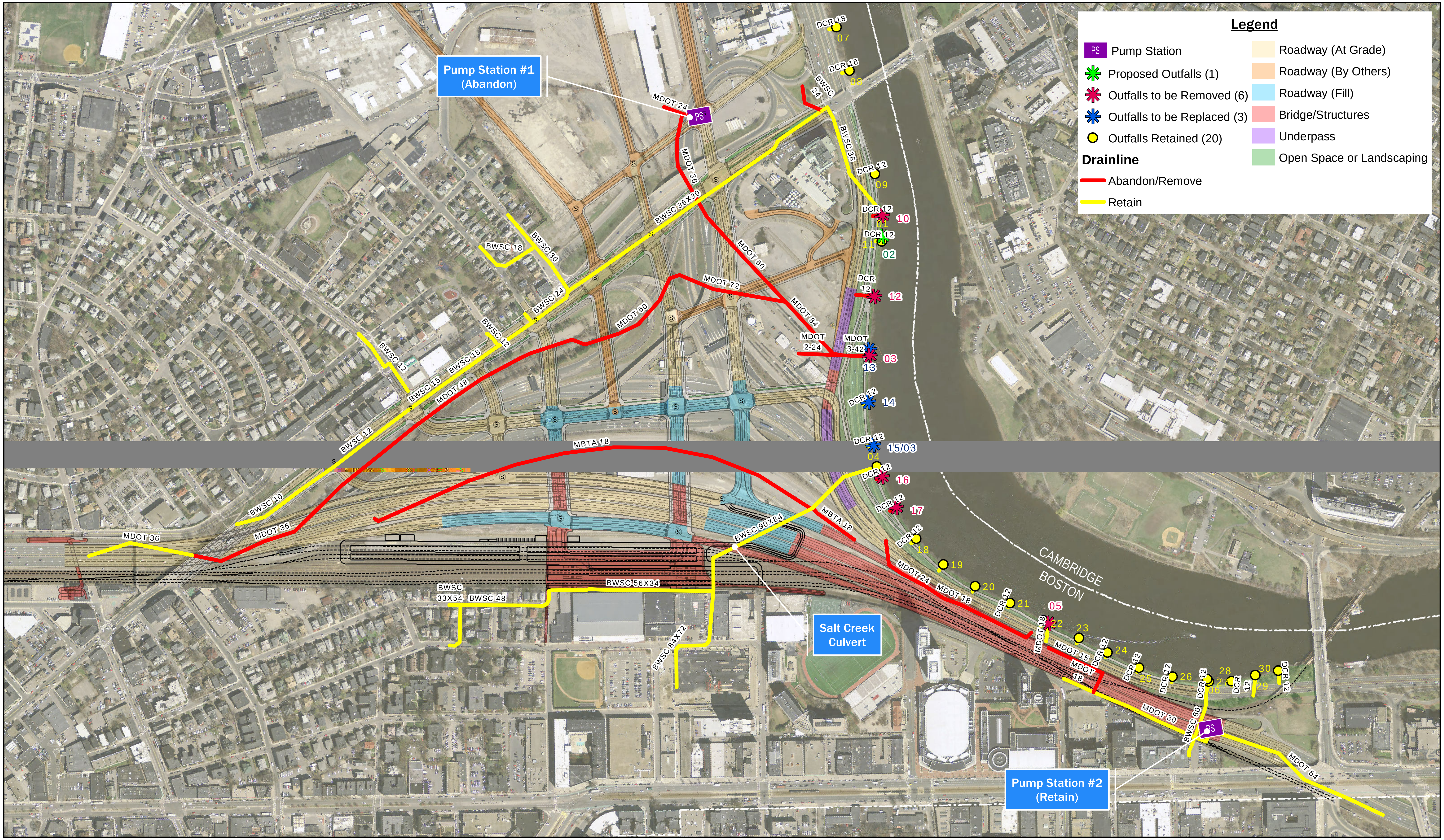
FIGURE
5.17-1

Proposed Stormwater BMPs
3K-HV


Legend
PS Pump Station
Proposed Outfalls (1)
Outfalls to be Removed (6)
Outfalls to be Replaced (3)
Outfalls Retained (20)
Drainline
Abandon/Remove
Retain
Roadway (At Grade)
Roadway (By Others)
Roadway (Fill)
Bridge/Structures
Underpass
Open Space or Landscaping
Pump Station #1 (Abandon)
Salt Creek Culvert
Pump Station #2 (Retain)
CAMBRIDGE
BOSTON
PS
MDOT 24
MDOT 36
MDOT 60
MDOT 72
MDOT 84
MDOT 2-24
MDOT 3-42
MDOT 48
MDOT 15
MDOT 18
MDOT 30
MDOT 54
MBTA 18
BWSC 24
BWSC 36
BWSC 36X30
BWSC 18
BWSC 30
BWSC 12
BWSC 15
BWSC 10
BWSC 90X84
BWSC 56X34
BWSC 33X54
BWSC 48
BWSC 84X72
BWSC 60
DCR 18
DCR 12
07
08
09
10
01
11
02
12
03
13
14
15/03
04
16
17
18
19
20
21
05
22
23
24
25
26
27
06
28
29
30

INTERSTATE 90 ALLSTON INTERCHANGE

massDOT Massachusetts Department of Transportation Highway Division

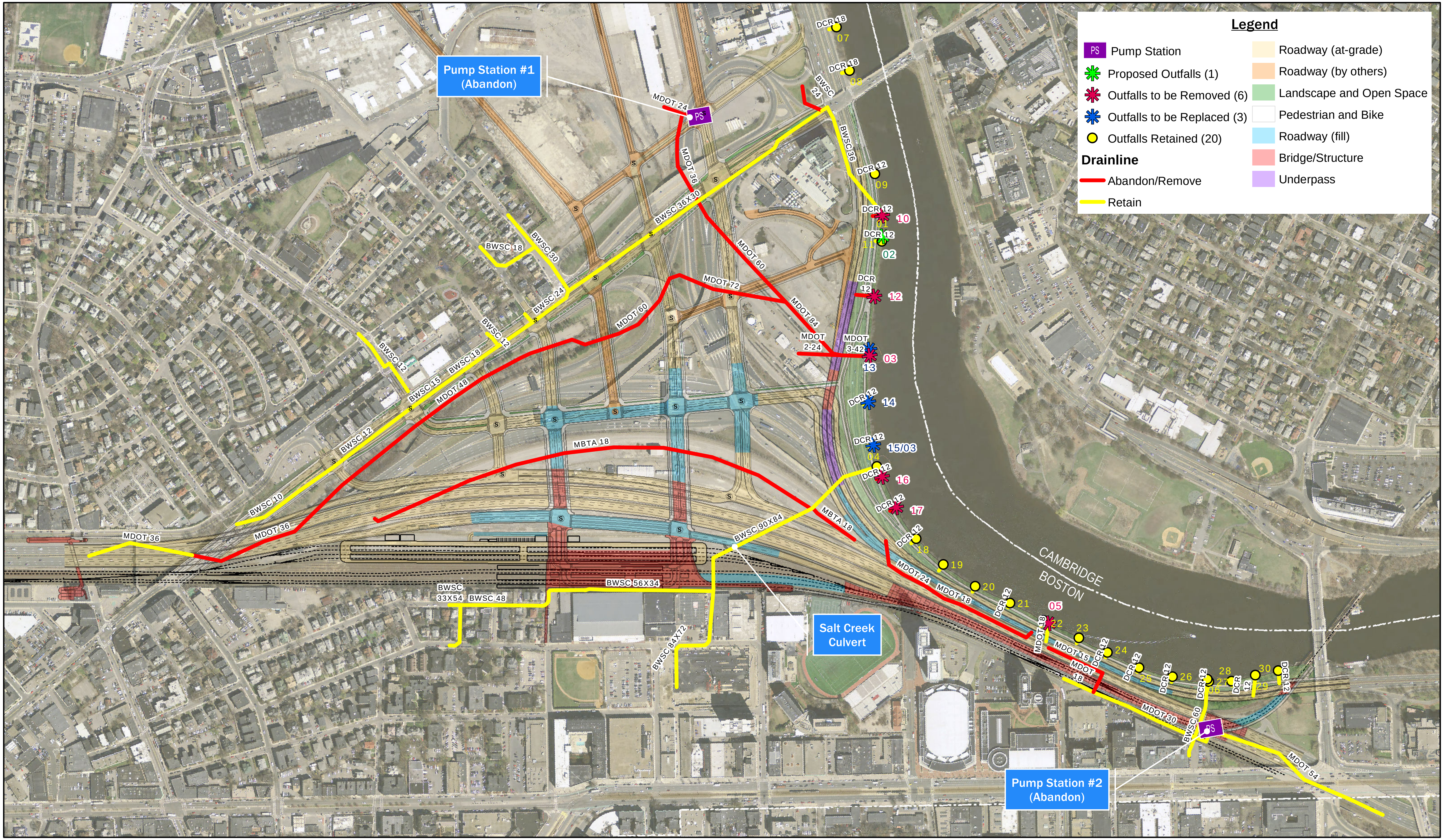
0 225 450
Feet

Note: All Drain Line Sizes are in Inches

I-90 Allston Interchange Project
Draft Environmental Impact Report

Existing Drainage Overlay 3K-HV

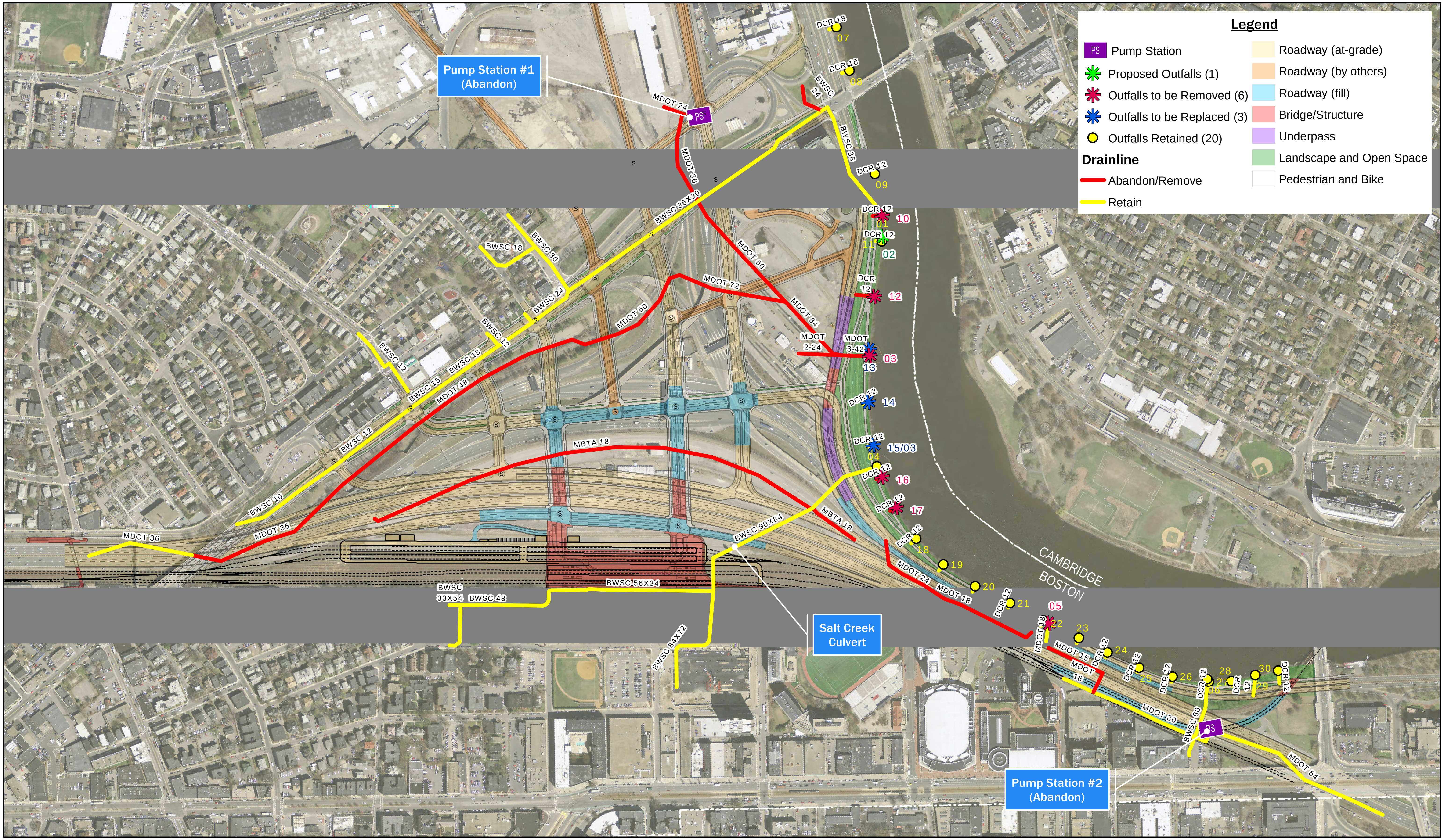
FIGURE
5.17-5


Legend
PS Pump Station
Proposed Outfalls (1)
Outfalls to be Removed (6)
Outfalls to be Replaced (3)
Outfalls Retained (20)
Drainline
Abandon/Remove
Retain
Roadway (at-grade)
Roadway (by others)
Landscape and Open Space
Pedestrian and Bike
Roadway (fill)
Bridge/Structure
Underpass
Pump Station #1 (Abandon)
Salt Creek Culvert
Pump Station #2 (Abandon)
CAMBRIDGE
BOSTON
MDOT 24
MDOT 36
MDOT 60
MDOT 72
MDOT 84
MDOT 2-24
MDOT 3-42
MDOT 48
MDOT 18
MDOT 15
MDOT 30
MDOT 54
MBTA 18
BWSC 24
BWSC 36
BWSC 36X30
BWSC 18
BWSC 30
BWSC 12
BWSC 15
BWSC 10
BWSC 90X84
BWSC 56X34
BWSC 33X54
BWSC 48
BWSC 84X72
BWSC 60
DCR 18
DCR 12
07
08
09
10
01
02
11
12
03
13
14
15/03
04
16
17
18
19
20
21
05
22
23
24
25
26
27
06
28
29
30
0 225 450
Feet

Note: All Drain Line Sizes are in Inches

FIGURE
5.17-6

Existing Drainage
Overlay 3K-AMP


Legend
PS Pump Station
Proposed Outfalls (1)
Outfalls to be Removed (6)
Outfalls to be Replaced (3)
Outfalls Retained (20)
Drainline
Abandon/Remove
Retain
Roadway (at-grade)
Roadway (by others)
Roadway (fill)
Bridge/Structure
Underpass
Landscape and Open Space
Pedestrian and Bike
Pump Station #1 (Abandon)
Salt Creek Culvert
Pump Station #2 (Abandon)
CAMBRIDGE
BOSTON
PS
MDOT 24
MDOT 36
MDOT 60
MDOT 72
MDOT 84
MDOT 2-24
MDOT 3-42
MDOT 48
MDOT 36
MDOT 36
MBTA 18
MBTA 18
MDOT 24
MDOT 18
MDOT 18
MDOT 15
MDOT 18
MDOT 30
MDOT 54
BWSC 24
BWSC 36
BWSC 36X30
BWSC 18
BWSC 30
BWSC 24
BWSC 12
BWSC 12
BWSC 18
BWSC 15
BWSC 12
BWSC 10
BWSC 90X84
BWSC 56X34
BWSC 33X54
BWSC 48
BWSC 84X72
BWSC 60
DCR 18
07
DCR 18
08
DCR 12
09
DCR 12
10
01
DCR 12
11
02
DCR 12
12
03
13
DCR 12
14
DCR 12
15/03
04
DCR 12
16
DCR 12
17
DCR 12
18
19
20
DCR 12
21
05
22
23
DCR 12
24
DCR 12
25
DCR 12
26
DCR 12
27
28
06
DCR 12
29
30
DCR 12
S

Note: All Drain Line Sizes are in Inches

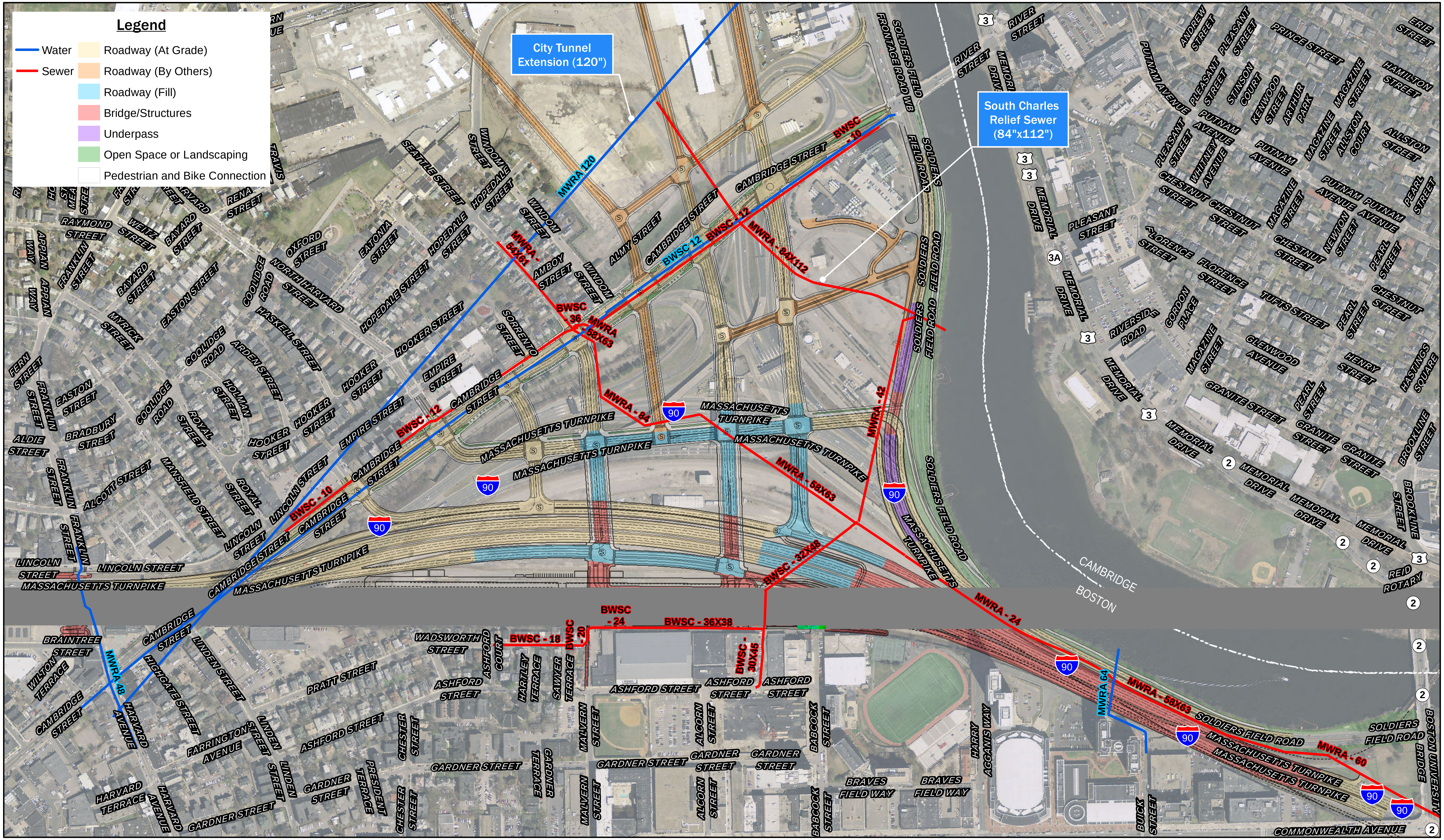
0 225 450
Feet

ALLSTON INTERCHANGE

I-90 Allston Interchange Project
Draft Environmental Impact Report

Existing Drainage Overlay 3K-ABC

FIGURE 5.17-7


Legend
Water
Sewer
Roadway (At Grade)
Roadway (By Others)
Roadway (Fill)
Bridge/Structures
Underpass
Open Space or Landscaping
Pedestrian and Bike Connection
City Tunnel Extension (120")
South Charles Relief Sewer (84"x112")
MWRA 120
BWSC 12
BWSC - 10
BWSC - 12
MWRA - 84X112
MWRA - 54X61
BWSC - 36
MWRA - 58X63
MWRA - 84
MWRA - 42
BWSC - 12
BWSC - 10
BWSC - 32X48
MWRA - 24
BWSC - 24
BWSC - 36X38
BWSC - 18
BWSC - 20
BWSC - 30X45
MWRA 48
MWRA 64
MWRA - 58X63
MWRA - 60
CAMBRIDGE
BOSTON
CAMBRIDGE STREET
MASSACHUSETTS TURNPIKE
SOLDIERS FIELD ROAD
MEMORIAL DRIVE
LINCOLN STREET
ASHFORD STREET
GARDNER STREET
BRAVES FIELD WAY
COMMONWEALTH AVENUE
HARVARD AVENUE
BRAINTREE STREET
WADSWORTH STREET
BABCOCK STREET
MALVERN STREET
ALCORN STREET
BUICK STREET
HARRY AGGANIS WAY
BOSTON UNIVERSITY BRIDGE
RIVER STREET
WESTERN AVENUE
SOLDIERS FIELD ROAD WB FRONTAGE ROAD
HOOKER STREET
EMPIRE STREET
FRANKLIN STREET
SEATTLE STREET
WINDOM STREET
ALMY STREET
SORRENTO STREET
PUTNAM AVENUE
PLEASANT STREET
MAGAZINE STREET
GRANITE STREET
RIVERSIDE ROAD
90
3
2
3A

0 200 400
Feet

Note: All Pipe Sizes in Inches unless otherwise Noted

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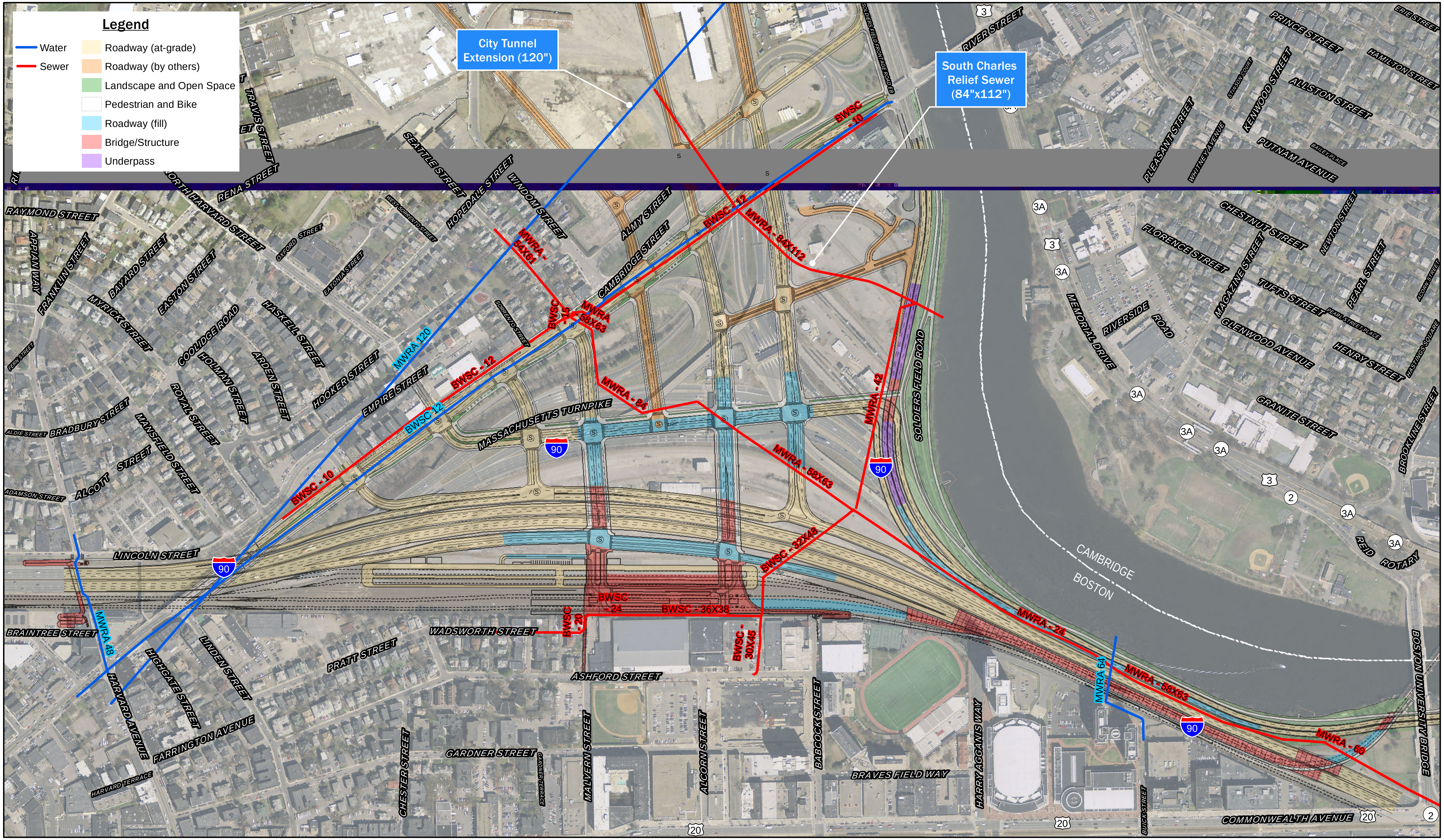
FIGURE

Major Water and Sewer Utilities - 3K-HV

5.18-1


Legend
Water
Sewer
Roadway (at-grade)
Roadway (by others)
Landscape and Open Space
Pedestrian and Bike
Roadway (fill)
Bridge/Structure
Underpass
City Tunnel Extension (120")
South Charles Relief Sewer (84"x112")
MWRA 120
MWRA - 54X61
MWRA - 58X63
MWRA - 84
MWRA - 84X112
MWRA - 42
MWRA - 58X63
MWRA - 24
MWRA - 58X63
MWRA - 60
MWRA 64
MWRA 48
BWSC - 10
BWSC - 12
BWSC - 12
BWSC - 10
BWSC 12
BWSC - 15
BWSC - 32X48
BWSC - 24
BWSC - 36X38
BWSC - 20
BWSC - 30X45
MASSACHUSETTS TURNPIKE
90
3
3A
2
20
CAMBRIDGE
BOSTON
RIVER STREET
SOLDIERS FIELD FRONTAGE ROAD
SOLDIERS FIELD ROAD
PRINCE STREET
ERIE STREET
HAMILTON STREET
ALLSTON STREET
KENWOOD STREET
STINSON COURT
PUTNAM AVENUE
BAILEY PLACE
PLEASANT STREET
WHITNEY AVENUE
CHESTNUT STREET
NEWTON STREET
FLORENCE STREET
MAGAZINE STREET
PEARL STREET
TUFTS STREET
PEARL STREET PLACE
ACORN STREET
GLENWOOD AVENUE
HENRY STREET
HASTINGS SQUARE
RIVERSIDE ROAD
MEMORIAL DRIVE
GRANITE STREET
BROOKLINE STREET
REID ROTARY
BOSTON UNIVERSITY BRIDGE
TRAVIS STREET
RENA STREET
NORTH HARVARD STREET
SEATTLE STREET
HOPEDALE STREET
WINDOM STREET
WEST SORRENTO STREET
ALMY STREET
CAMBRIDGE STREET
RAYMOND STREET
APPIAN WAY
FRANKLIN STREET
BAYARD STREET
EASTON STREET
OXFORD STREET
EATONIA STREET
MYRICK STREET
COOLIDGE ROAD
HASKELL STREET
SORRENTO STREET
FERN STREET
HOLMAN STREET
ARDEN STREET
HOOKER STREET
EMPIRE STREET
ROYAL STREET
BRADBURY STREET
ALDIE STREET
MANSFIELD STREET
ALCOTT STREET
ADAMSON STREET
LINCOLN STREET
BRAINTREE STREET
WADSWORTH STREET
PRATT STREET
LINDEN STREET
HIGHGATE STREET
HARVARD AVENUE
ASHFORD STREET
FARRINGTON AVENUE
HARVARD TERRACE
GARDNER STREET
GARDNER TERRACE
CHESTER STREET
MALVERN STREET
ALCORN STREET
BABCOCK STREET
HARRY AGGANIS WAY
BRAVES FIELD WAY
BUICK STREET
COMMONWEALTH AVENUE
0
200
400
Feet

INTERSTATE 90 ALLSTON INTERCHANGE

massDOT Massachusetts Department of Transportation Highway Division

Note: All Pipe Sizes in Inches
unless otherwise Noted

I-90 Allston Interchange Project
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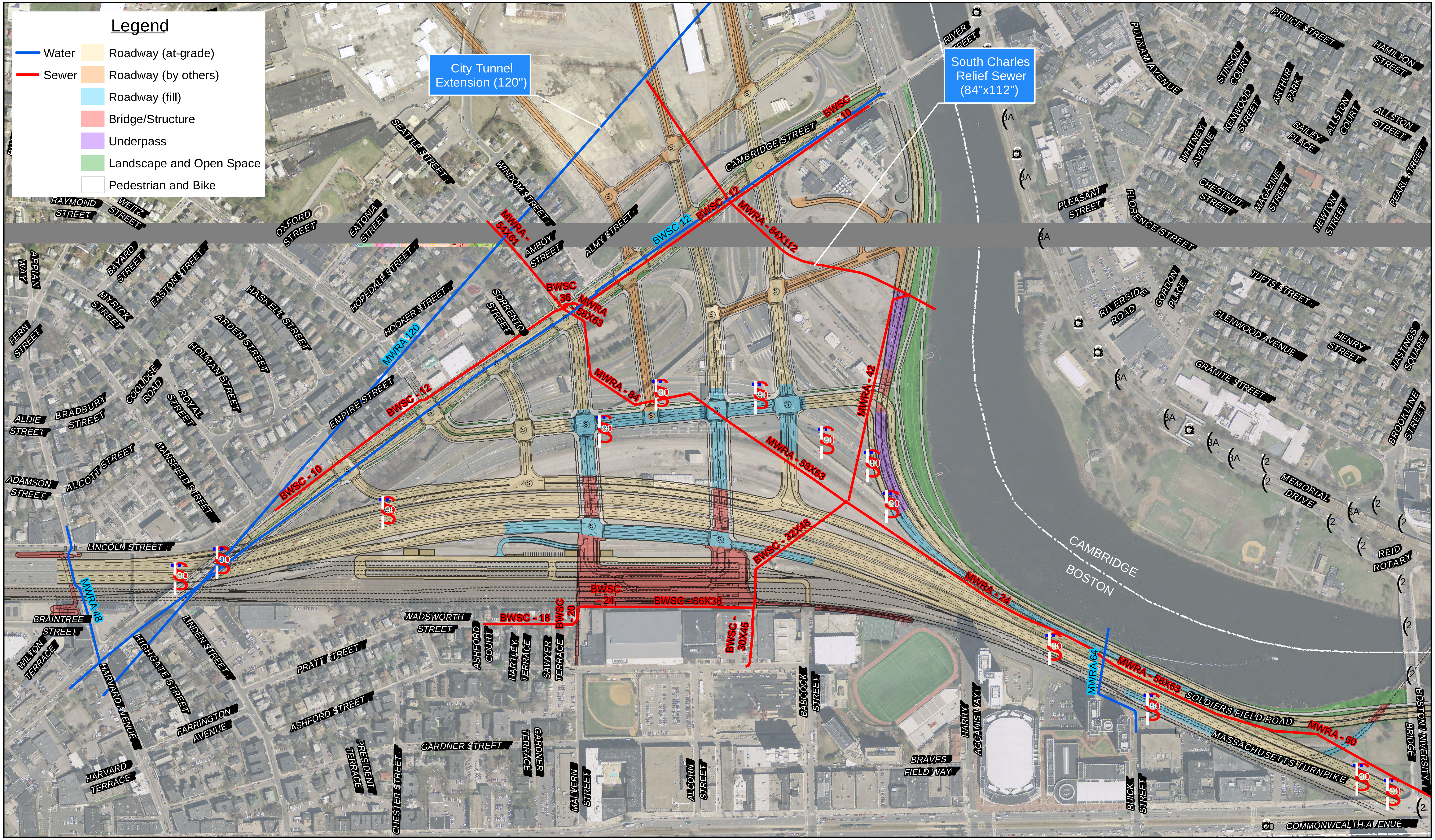
FIGURE
5.18-2

Major Water and Sewer Utilities - 3K-AMP


Legend
Water
Sewer
Roadway (at-grade)
Roadway (by others)
Roadway (fill)
Bridge/Structure
Underpass
Landscape and Open Space
Pedestrian and Bike
City Tunnel Extension (120")
South Charles Relief Sewer (84"x112")
BWSC - 10
BWSC 12
BWSC - 12
BWSC 36
BWSC - 24
BWSC - 36X38
BWSC - 18
BWSC - 20
BWSC - 30X45
BWSC - 32X48
MWRA - 54X61
MWRA - 58X63
MWRA - 84X112
MWRA - 24
MWRA - 42
MWRA - 60
MWRA 120
MWRA 48
MWRA 64
CAMBRIDGE
BOSTON
CAMBRIDGE STREET
RIVER STREET
PUTNAM AVENUE
PRINCE STREET
HAMILTON STREET
STINSON COURT
KENWOOD STREET
ARTHUR PARK
ALLSTON COURT
ALLSTON STREET
BAILEY PLACE
WHITNEY AVENUE
CHESTNUT STREET
MAGAZINE STREET
NEWTON STREET
PEARL STREET
PLEASANT STREET
FLORENCE STREET
TUFTS STREET
GORDON PLACE
RIVERSIDE ROAD
GLENWOOD AVENUE
HENRY STREET
HASTINGS SQUARE
GRANITE STREET
BROOKLINE STREET
MEMORIAL DRIVE
REID ROTARY
SEATTLE STREET
WINDOM STREET
RAYMOND STREET
WEITZ STREET
OXFORD STREET
EATONIA STREET
AMBOY STREET
ALMY STREET
APPIAN WAY
BAYARD STREET
EASTON STREET
HOPEDALE STREET
MYRICK STREET
HASKELL STREET
SORRENTO STREET
HOOKER STREET
FERN STREET
ARDEN STREET
HOLMAN STREET
COOLIDGE ROAD
ROYAL STREET
EMPIRE STREET
BRADBURY STREET
ALDIE STREET
MANSFIELD STREET
ADAMSON STREET
ALCOTT STREET
LINCOLN STREET
BRAINTREE STREET
WILTON TERRACE
LINDEN STREET
HIGHGATE STREET
HARVARD AVENUE
HARVARD TERRACE
FARRINGTON AVENUE
WADSWORTH STREET
PRATT STREET
ASHFORD COURT
HARTLEY TERRACE
SAWYER TERRACE
ASHFORD STREET
GARDNER STREET
GARDNER TERRACE
PRESIDENT TERRACE
CHESTER STREET
MALVERN STREET
ALCORN STREET
BABCOCK STREET
HARRY AGGANIS WAY
BRAVES FIELD WAY
BUICK STREET
SOLDIERS FIELD ROAD
MASSACHUSETTS TURNPIKE
BOSTON UNIVERSITY BRIDGE
COMMONWEALTH AVENUE
90
BA
2
N

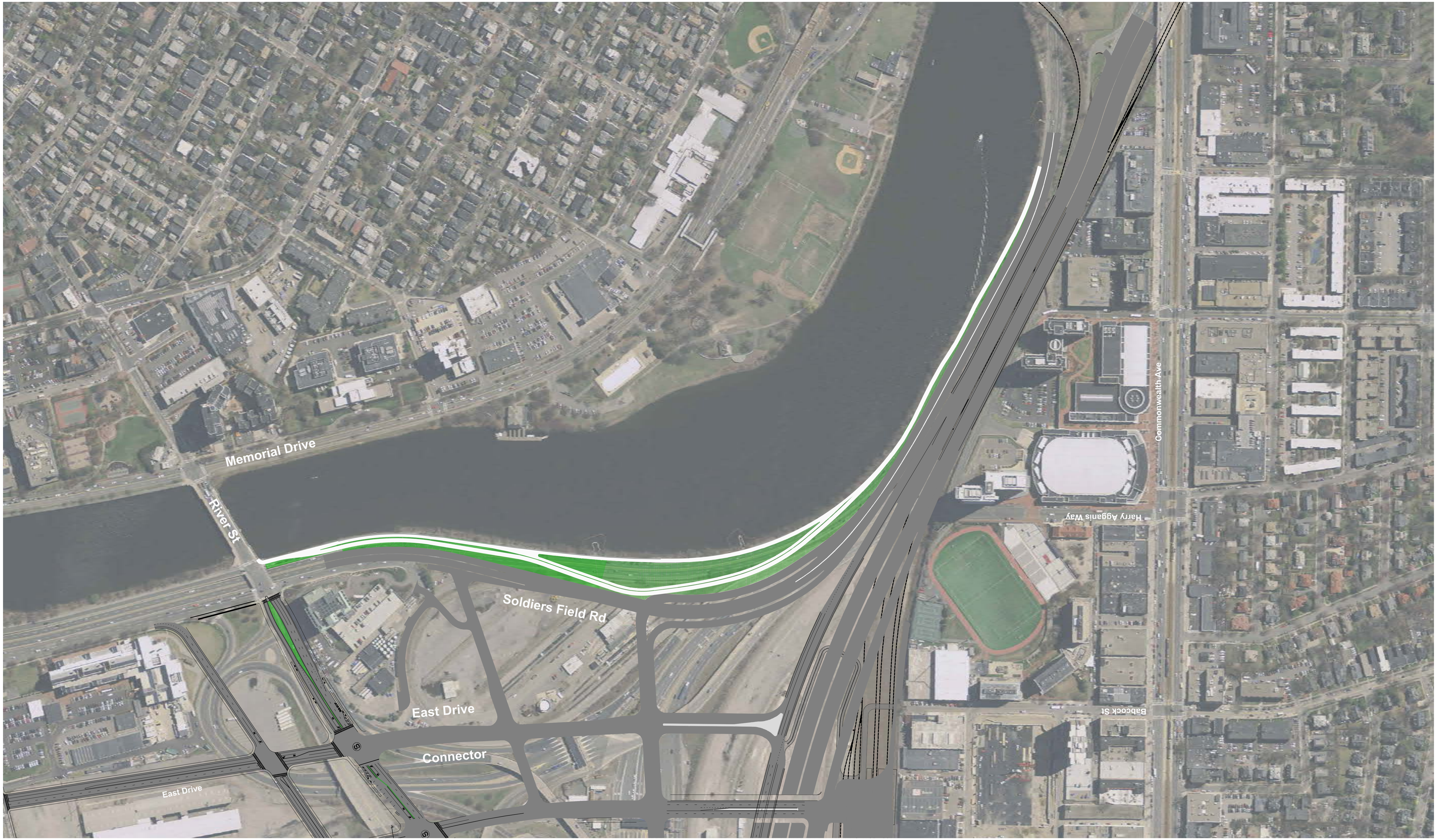
0 200 400
Feet

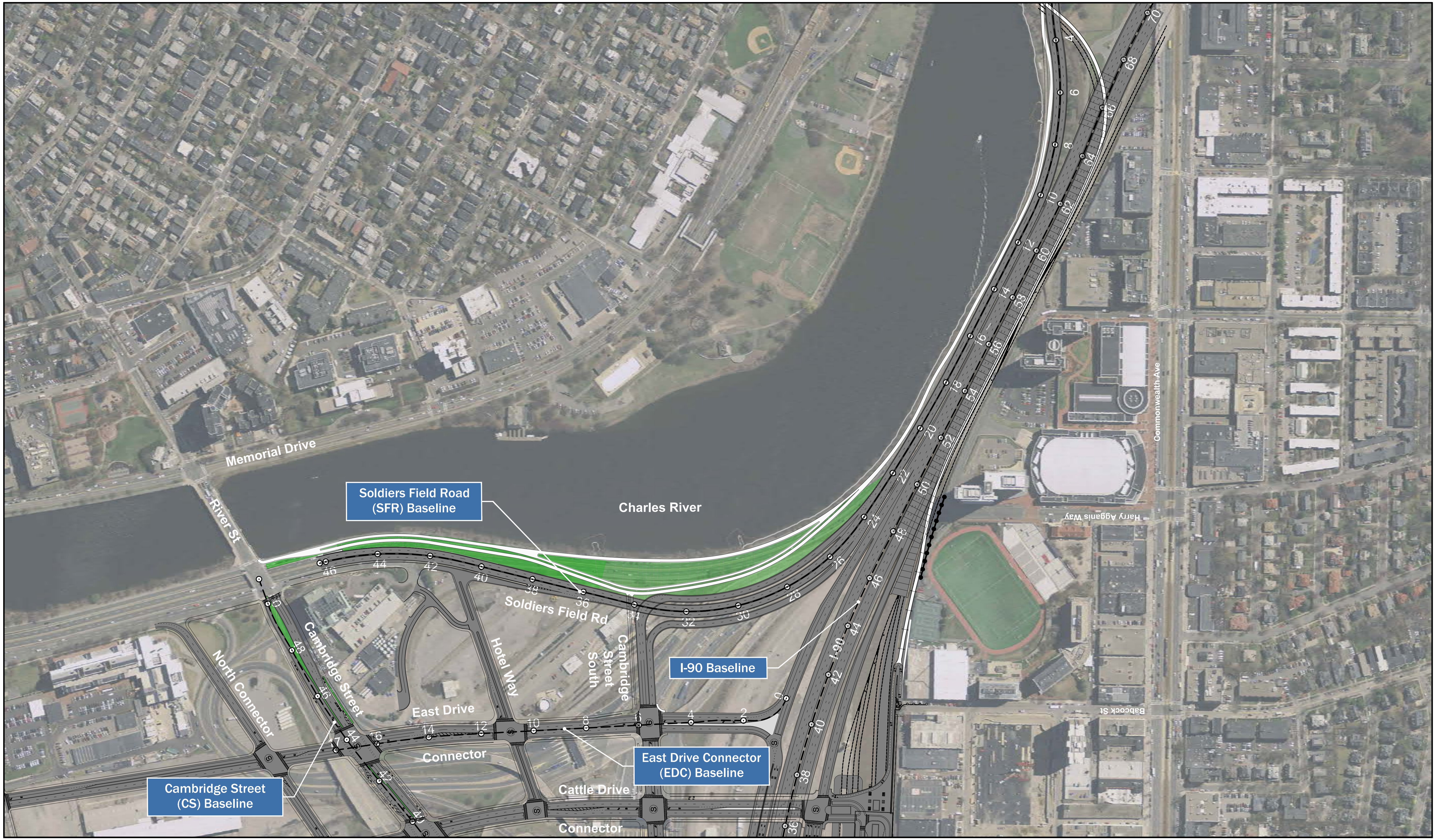
I-90 Allston Interchange Project
Draft Environmental Impact Report

Note: All Pipe Sizes in Inches unless otherwise Noted

FIGURE

Major Water and Sewer Utilities - 3K-ABC 5.18-3

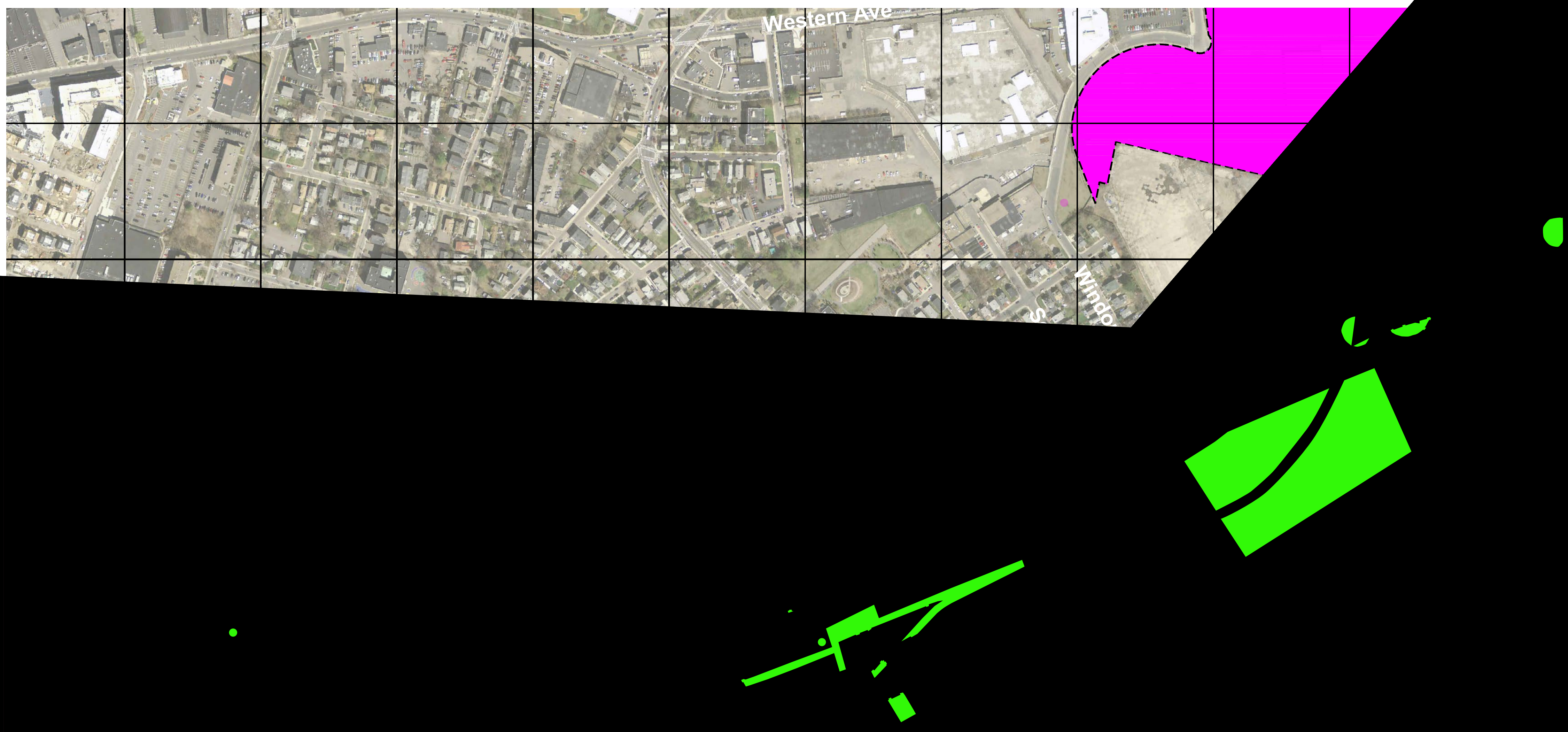

Memorial Drive
River St
Soldiers Field Rd
East Drive
Connector
East Drive
Commonwealth Ave
Harry Agganis Way
Babcock St


Memorial Drive
Soldiers Field Road
(SFR) Baseline
Charles River
River St
Soldiers Field Rd
Cambridge Street
North Connector
Hotel Way
South Street
Cambridge Street
I-90 Baseline
I-90
East Drive
Connector
East Drive Connector
(EDC) Baseline
Cattle Drive
Connector
Cambridge Street
(CS) Baseline
Commonwealth Ave
Harry Agganis Way
Babcock St

0 100 200
Feet

FIGURE
5.19-2

3K-AMP - Climate Change Baseline Stations



LEGEND

▬ ▬ PROJECT AREA

🟪 STATE OR FEDERALLY LISTED SITES

🟦 HISTORIC SITES OF POTENTIAL ENVIRONMENTAL CONCERN

🟩 OVERLAP OF STATE OR FEDERALLY LISTED SITES WITH HISTORIC SITES OF POTENTIAL CONCERN

500 0 125 250 500

250 500

Approximate Scale in Feet

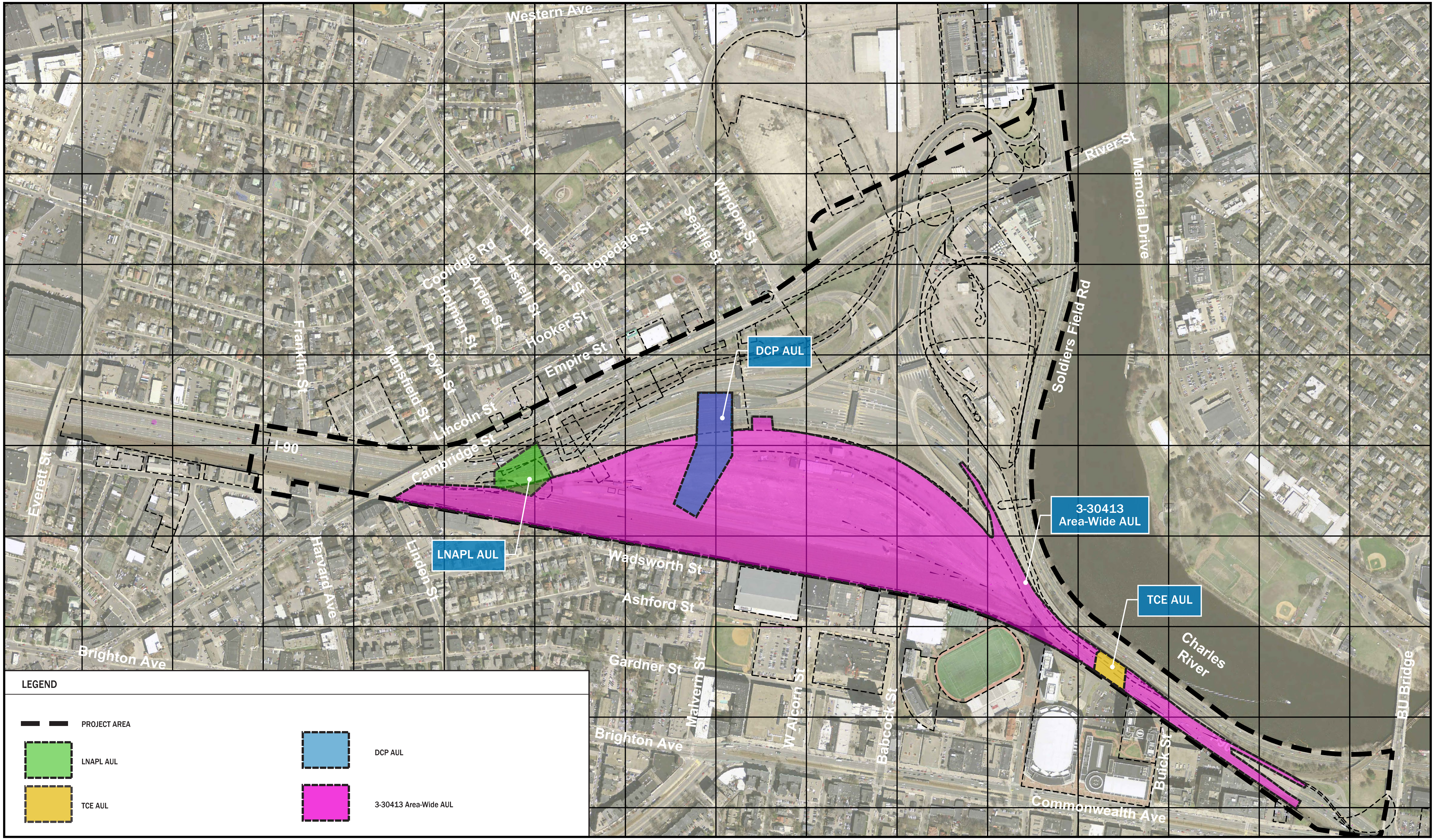
Feet

I-90 Interchange Allston, MA
Draft Environmental Impact Report

FIGU
5.2

Sites of Environmental Concern within Project Area

Sites of Environmental Concern within Project Area


Western Ave
River St
Memorial Drive
Windom St
Seattle St
Hopedale St
N Harvard St
Coolidge Rd
Haskell St
Arden St
Holman St
Hooker St
Empire St
Franklin St
Mansfield St
Royal St
Lincoln St
Cambridge St
I-90
Everett St
Soldiers Field Rd
DCP AUL
3-30413 Area-Wide AUL
LNAPL AUL
TCE AUL
Harvard Ave
Linden St
Wadsworth St
Ashford St
Charles River
Brighton Ave
Gardner St
Malvern St
W Alcorn St
Babcock St
Buick St
Commonwealth Ave
BU Bridge
LEGEND
PROJECT AREA
LNAPL AUL
TCE AUL
DCP AUL
3-30413 Area-Wide AUL
N
0
250
500
Feet

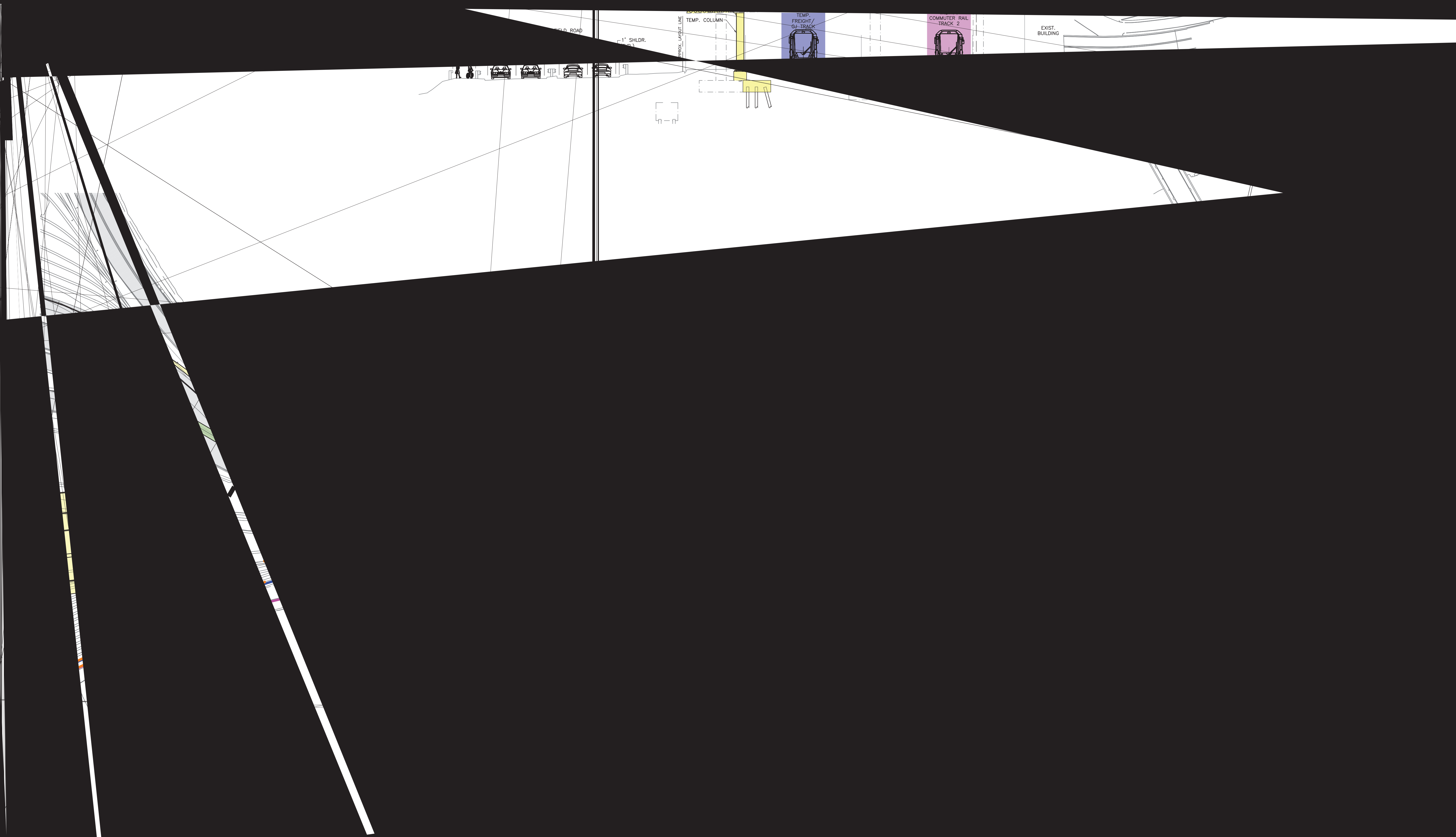
INTERSTATE 90
ALLSTON
INTERCHANGE

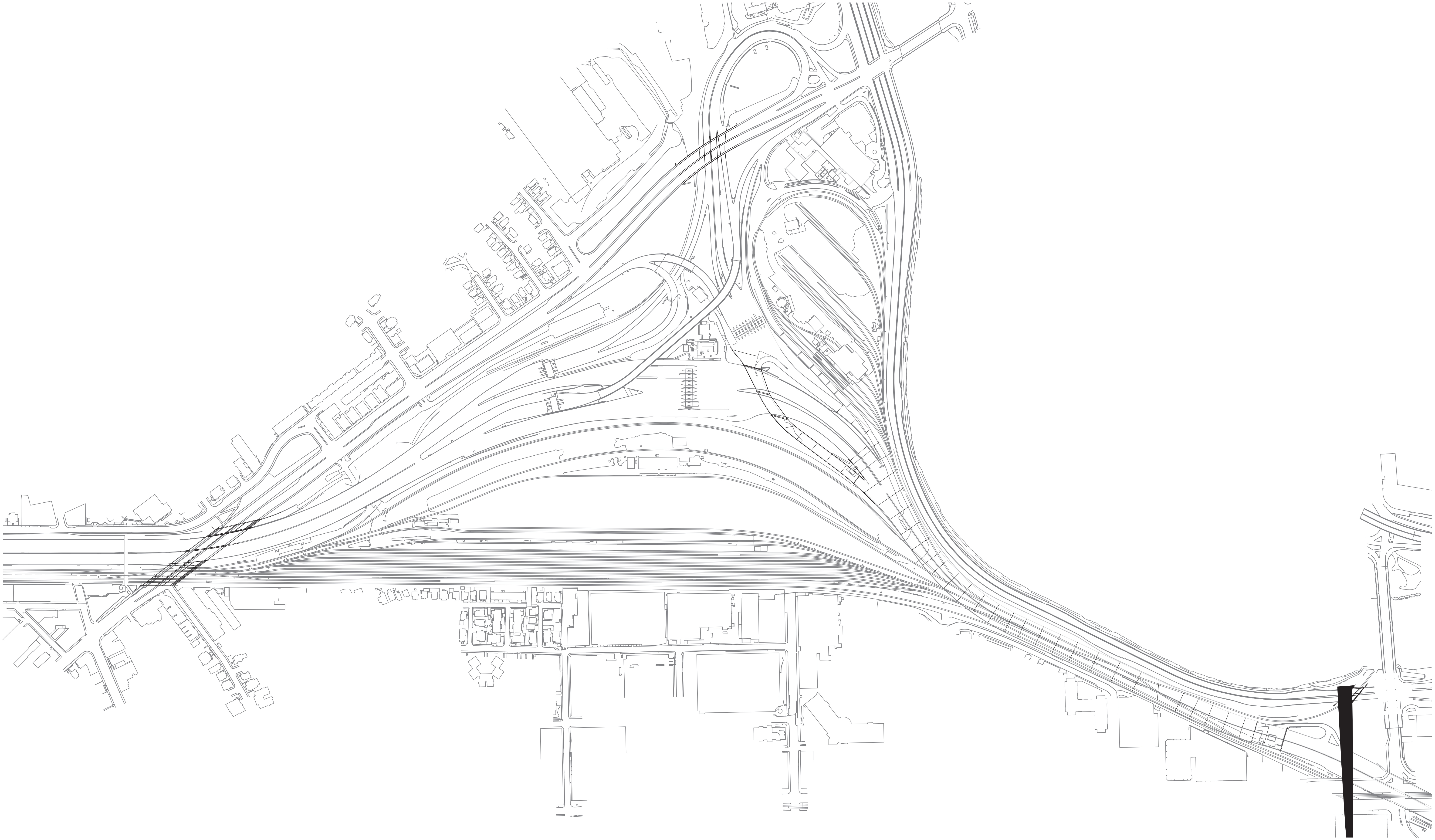
massDOT
Massachusetts Department of Transportation
Highway Division

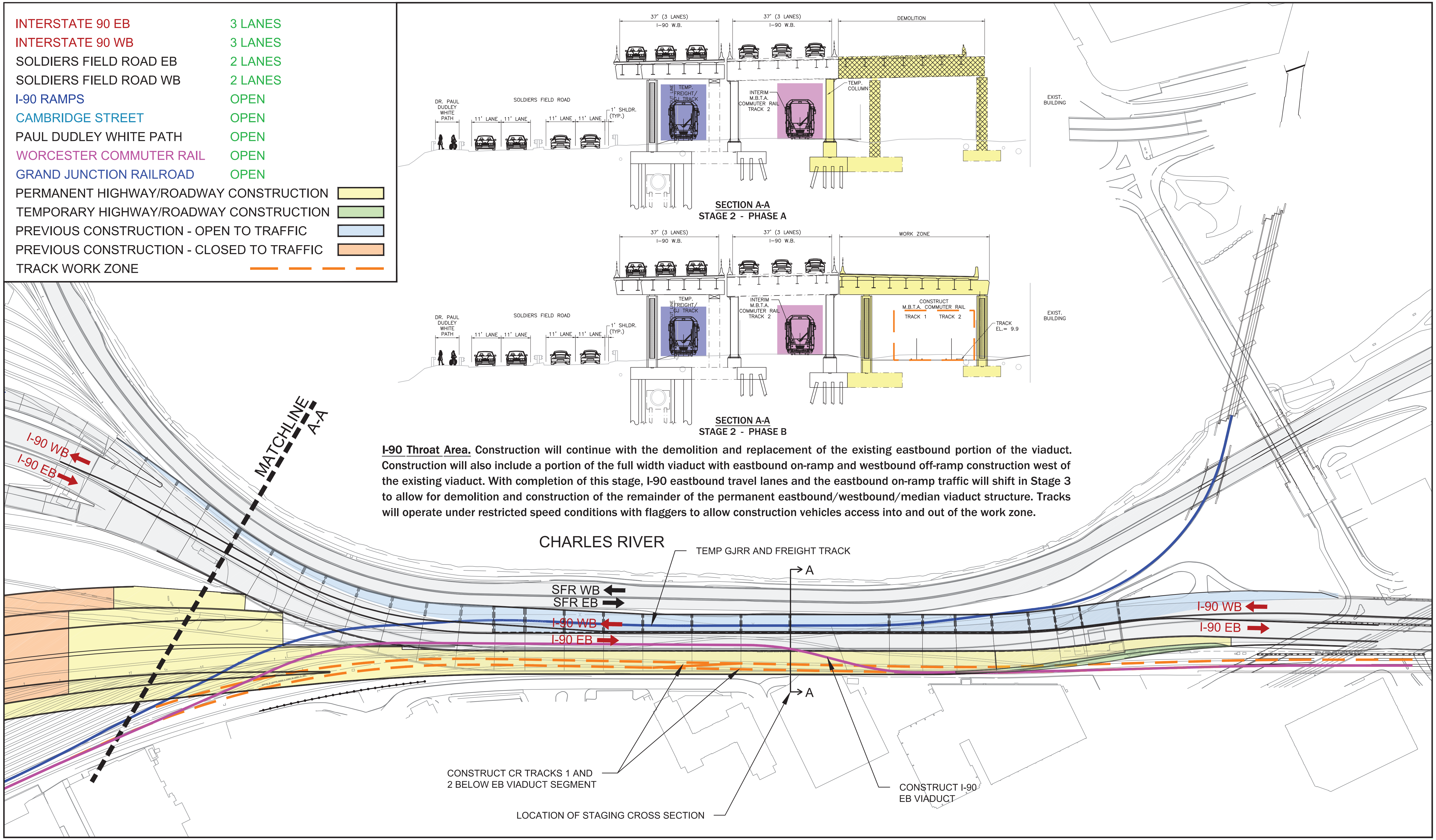
I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE
5.20-2

Location of AUL Areas


FIELD ROAD
1' SHLDR.
APPROX. LAYOUT LINE
TEMP. COLUMN
TEMP.
FREIGHT/
GJ TRACK
COMMUTER RAIL
TRACK 2
EXIST.
BUILDING




37' (3 LANES)
I-90 W.B.
37' (3 LANES)
I-90 W.B.
DEMOLITION
DR. PAUL DUDLEY WHITE PATH
SOLDIERS FIELD ROAD
11' LANE
11' LANE
11' LANE
11' LANE
1' SHLDR. (TYP.)
TEMP. FREIGHT/ GJ TRACK
INTERIM M.B.T.A. COMMUTER RAIL TRACK 2
TEMP. COLUMN
EXIST. BUILDING
SECTION A-A
STAGE 2 - PHASE A
37' (3 LANES)
I-90 W.B.
37' (3 LANES)
I-90 W.B.
WORK ZONE
DR. PAUL DUDLEY WHITE PATH
SOLDIERS FIELD ROAD
11' LANE
11' LANE
11' LANE
11' LANE
1' SHLDR. (TYP.)
TEMP. FREIGHT/ GJ TRACK
INTERIM M.B.T.A. COMMUTER RAIL TRACK 2
CONSTRUCT M.B.T.A. COMMUTER RAIL
TRACK 1
TRACK 2
TRACK EL.= 9.9
EXIST. BUILDING
SECTION A-A
STAGE 2 - PHASE B
MATCHLINE A-A
I-90 WB
I-90 EB
CHARLES RIVER
TEMP GJRR AND FREIGHT TRACK
A
A
SFR WB
SFR EB
I-90 WB
I-90 EB
I-90 WB
I-90 EB
CONSTRUCT CR TRACKS 1 AND 2 BELOW EB VIADUCT SEGMENT
LOCATION OF STAGING CROSS SECTION
CONSTRUCT I-90 EB VIADUCT

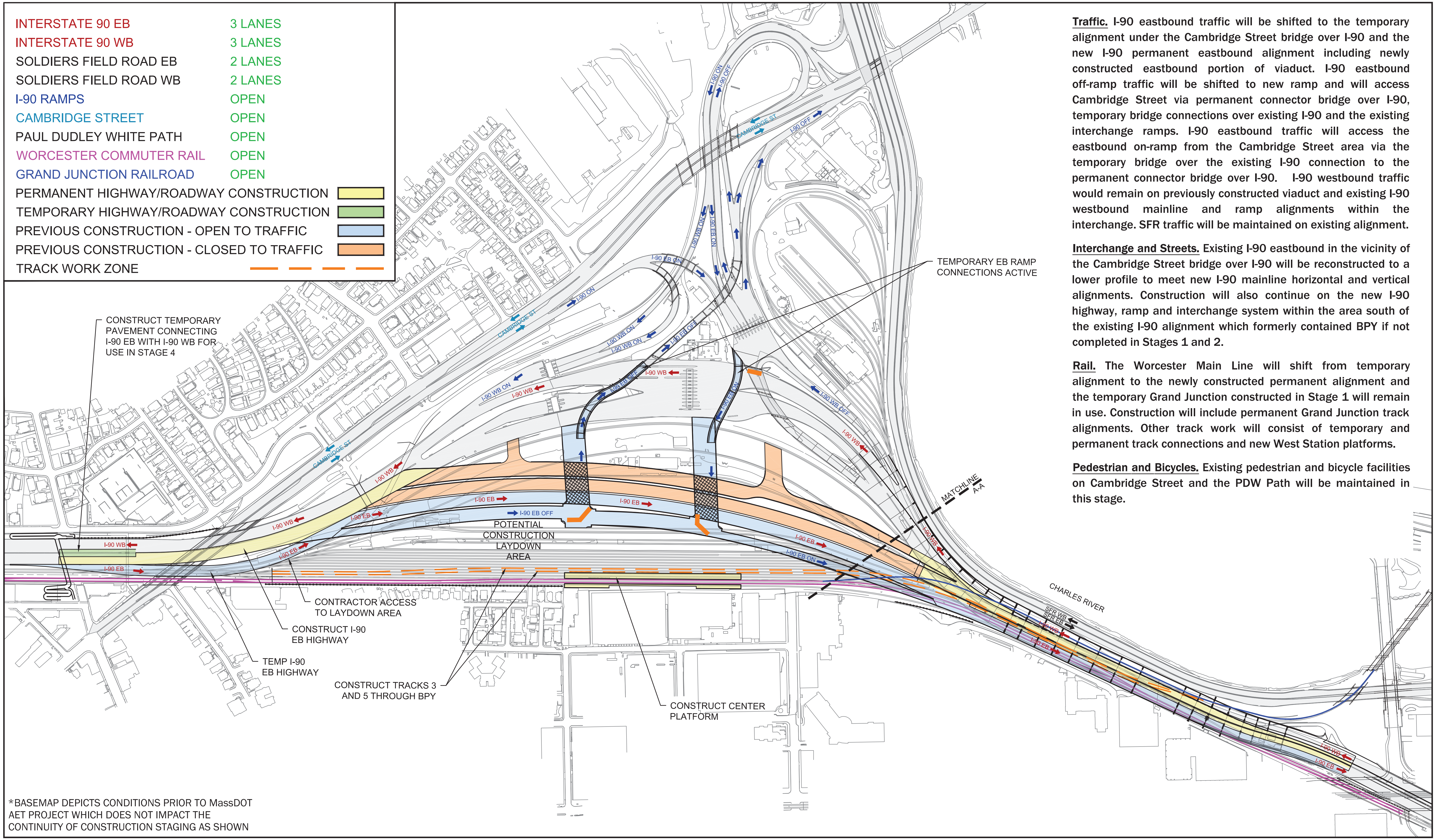
INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	OPEN
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	OPEN
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	— — — —

I-90 Throat Area. Construction will continue with the demolition and replacement of the existing eastbound portion of the viaduct. Construction will also include a portion of the full width viaduct with eastbound on-ramp and westbound off-ramp construction west of the existing viaduct. With completion of this stage, I-90 eastbound travel lanes and the eastbound on-ramp traffic will shift in Stage 3 to allow for demolition and construction of the remainder of the permanent eastbound/westbound/median viaduct structure. Tracks will operate under restricted speed conditions with flaggers to allow construction vehicles access into and out of the work zone.

0 100 200
Feet

I-90 Urban Interchange, 3K-HV
Construction Stage 2

FIGURE
5.21-4



TEMPORARY EB RAMP CONNECTIONS ACTIVE
CONSTRUCT TEMPORARY PAVEMENT CONNECTING I-90 EB WITH I-90 WB FOR USE IN STAGE 4
POTENTIAL CONSTRUCTION LAYDOWN AREA
CONTRACTOR ACCESS TO LAYDOWN AREA
CONSTRUCT I-90 EB HIGHWAY
TEMP I-90 EB HIGHWAY
CONSTRUCT TRACKS 3 AND 5 THROUGH BPY
CONSTRUCT CENTER PLATFORM
MATCHLINE A-A
CHARLES RIVER
CAMBRIDGE ST
I-90 ON
I-90 OFF
I-90 EB ON
I-90 EB OFF
I-90 WB ON
I-90 WB OFF
I-90 EB
I-90 WB
SFR WB
SFR EB

INTERSTATE 90 EB	3 LANES	
INTERSTATE 90 WB	3 LANES	
SOLDIERS FIELD ROAD EB	2 LANES	
SOLDIERS FIELD ROAD WB	2 LANES	
I-90 RAMPS	OPEN	
CAMBRIDGE STREET	OPEN	
PAUL DUDLEY WHITE PATH	OPEN	
WORCESTER COMMUTER RAIL	OPEN	
GRAND JUNCTION RAILROAD	OPEN	
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION		🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION		🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC		🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC		🟧
TRACK WORK ZONE		— — — —

Traffic. I-90 eastbound traffic will be shifted to the temporary alignment under the Cambridge Street bridge over I-90 and the new I-90 permanent eastbound alignment including newly constructed eastbound portion of viaduct. I-90 eastbound off-ramp traffic will be shifted to new ramp and will access Cambridge Street via permanent connector bridge over I-90, temporary bridge connections over existing I-90 and the existing interchange ramps. I-90 eastbound traffic will access the eastbound on-ramp from the Cambridge Street area via the temporary bridge over the existing I-90 connection to the permanent connector bridge over I-90. I-90 westbound traffic would remain on previously constructed viaduct and existing I-90 westbound mainline and ramp alignments within the interchange. SFR traffic will be maintained on existing alignment.

Interchange and Streets. Existing I-90 eastbound in the vicinity of the Cambridge Street bridge over I-90 will be reconstructed to a lower profile to meet new I-90 mainline horizontal and vertical alignments. Construction will also continue on the new I-90 highway, ramp and interchange system within the area south of the existing I-90 alignment which formerly contained BPY if not completed in Stages 1 and 2.

Rail. The Worcester Main Line will shift from temporary alignment to the newly constructed permanent alignment and the temporary Grand Junction constructed in Stage 1 will remain in use. Construction will include permanent Grand Junction track alignments. Other track work will consist of temporary and permanent track connections and new West Station platforms.

Pedestrian and Bicycles. Existing pedestrian and bicycle facilities on Cambridge Street and the PDW Path will be maintained in this stage.

*BASEMAP DEPICTS CONDITIONS PRIOR TO MassDOT AET PROJECT WHICH DOES NOT IMPACT THE CONTINUITY OF CONSTRUCTION STAGING AS SHOWN

N

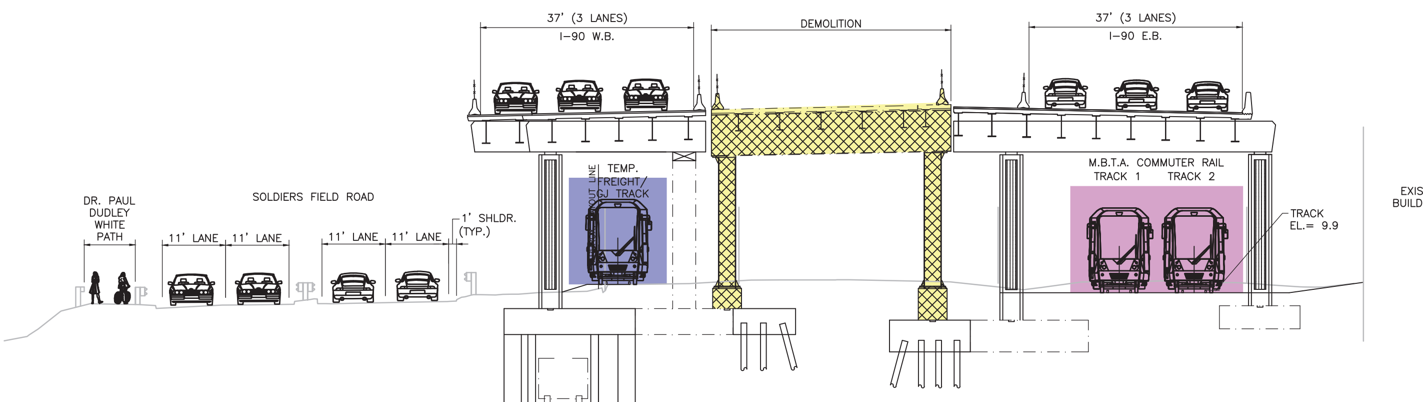
0 200 400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

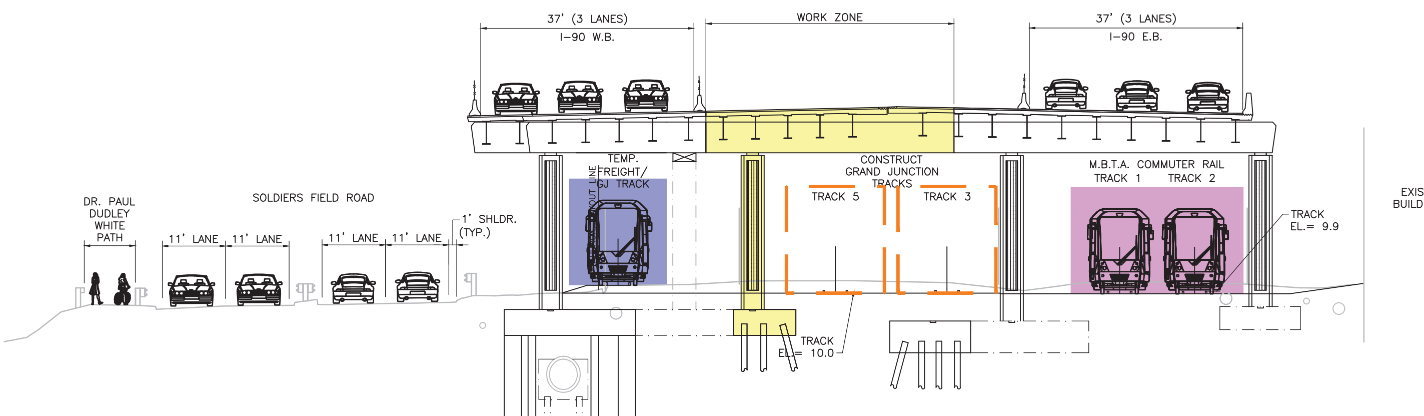
I-90 Urban Interchange, 3K-HV
Construction Stage 3

FIGURE
5.21-5

INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	OPEN
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	OPEN
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	– – – –

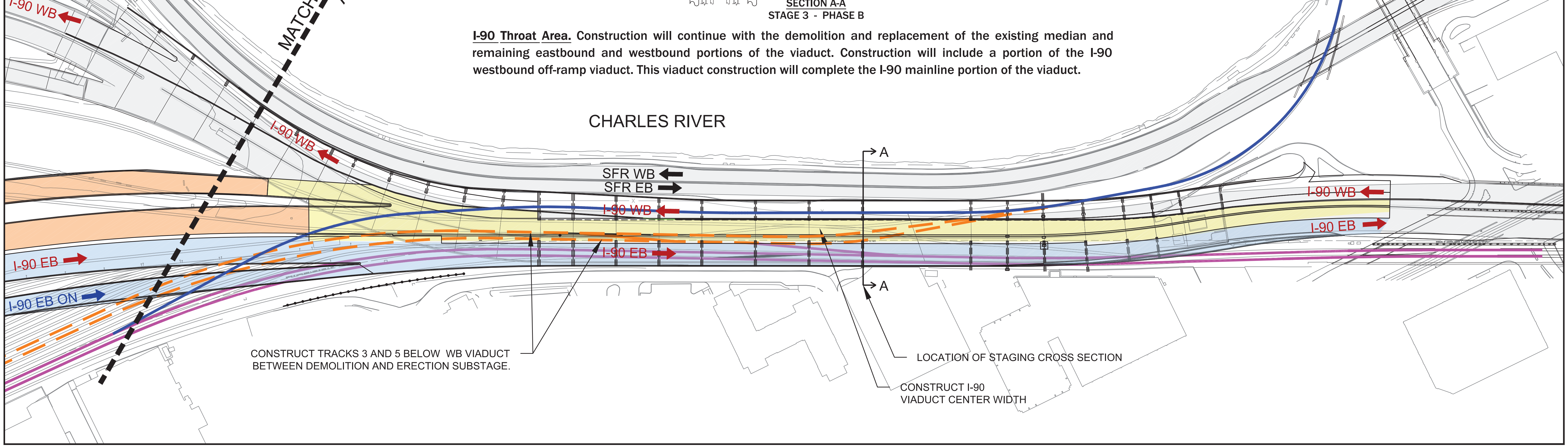

37' (3 LANES)
I-90 W.B.
DEMOLITION
37' (3 LANES)
I-90 E.B.
DR. PAUL DUDLEY WHITE PATH
SOLDIERS FIELD ROAD
11' LANE
11' LANE
11' LANE
11' LANE
1' SHLDR. (TYP.)
TEMP. FREIGHT/ GJ TRACK
M.B.T.A. COMMUTER RAIL
TRACK 1
TRACK 2
TRACK EL.= 9.9
EXIST. BUILDING

SECTION A-A
STAGE 3 - PHASE A


37' (3 LANES)
I-90 W.B.
WORK ZONE
37' (3 LANES)
I-90 E.B.
DR. PAUL DUDLEY WHITE PATH
SOLDIERS FIELD ROAD
11' LANE
11' LANE
11' LANE
11' LANE
1' SHLDR. (TYP.)
TEMP. FREIGHT/ GJ TRACK
CONSTRUCT GRAND JUNCTION TRACKS
TRACK 5
TRACK 3
TRACK EL.= 10.0
M.B.T.A. COMMUTER RAIL
TRACK 1
TRACK 2
TRACK EL.= 9.9
EXIST. BUILDING

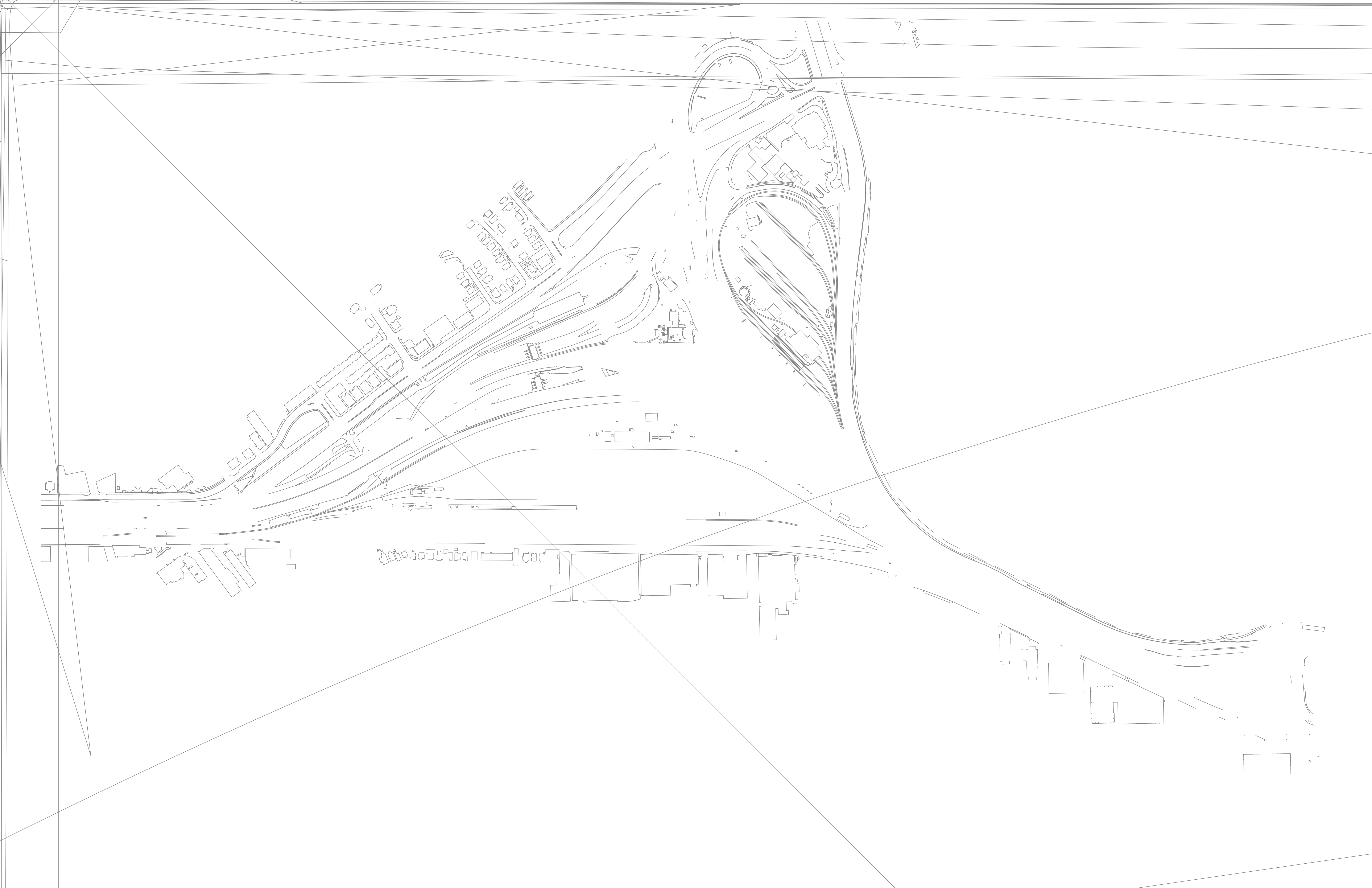
SECTION A-A
STAGE 3 - PHASE B

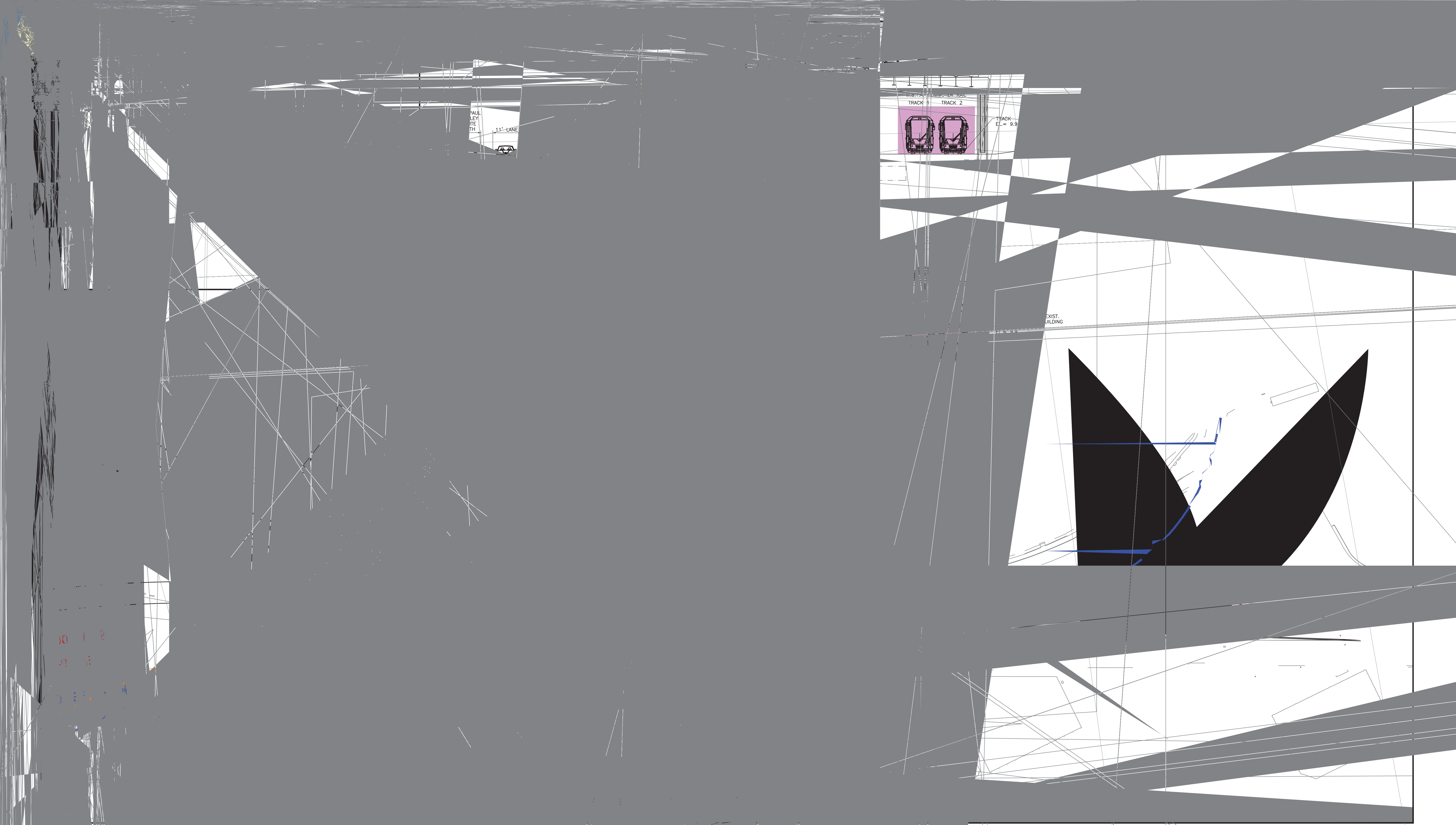
I-90 Throat Area. Construction will continue with the demolition and replacement of the existing median and remaining eastbound and westbound portions of the viaduct. Construction will include a portion of the I-90 westbound off-ramp viaduct. This viaduct construction will complete the I-90 mainline portion of the viaduct.

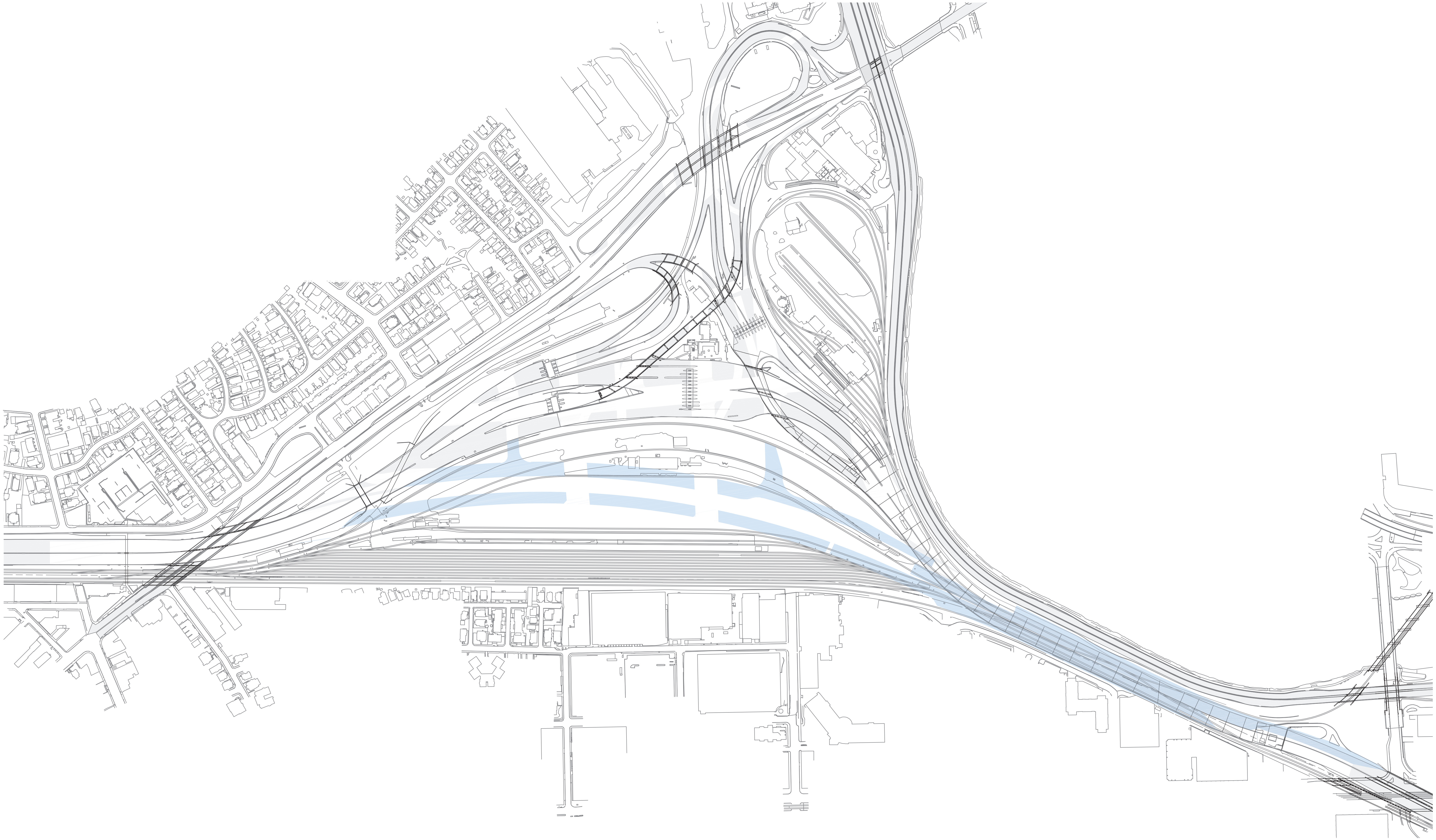

I-90 WB
MATCHLINE A-A
I-90 WB
CHARLES RIVER
SFR WB
SFR EB
I-90 WB
I-90 WB
I-90 EB
I-90 EB
I-90 EB
I-90 EB ON
A
A
CONSTRUCT TRACKS 3 AND 5 BELOW WB VIADUCT BETWEEN DEMOLITION AND ERECTION SUBSTAGE.
LOCATION OF STAGING CROSS SECTION
CONSTRUCT I-90 VIADUCT CENTER WIDTH
N
0
100
200
Feet

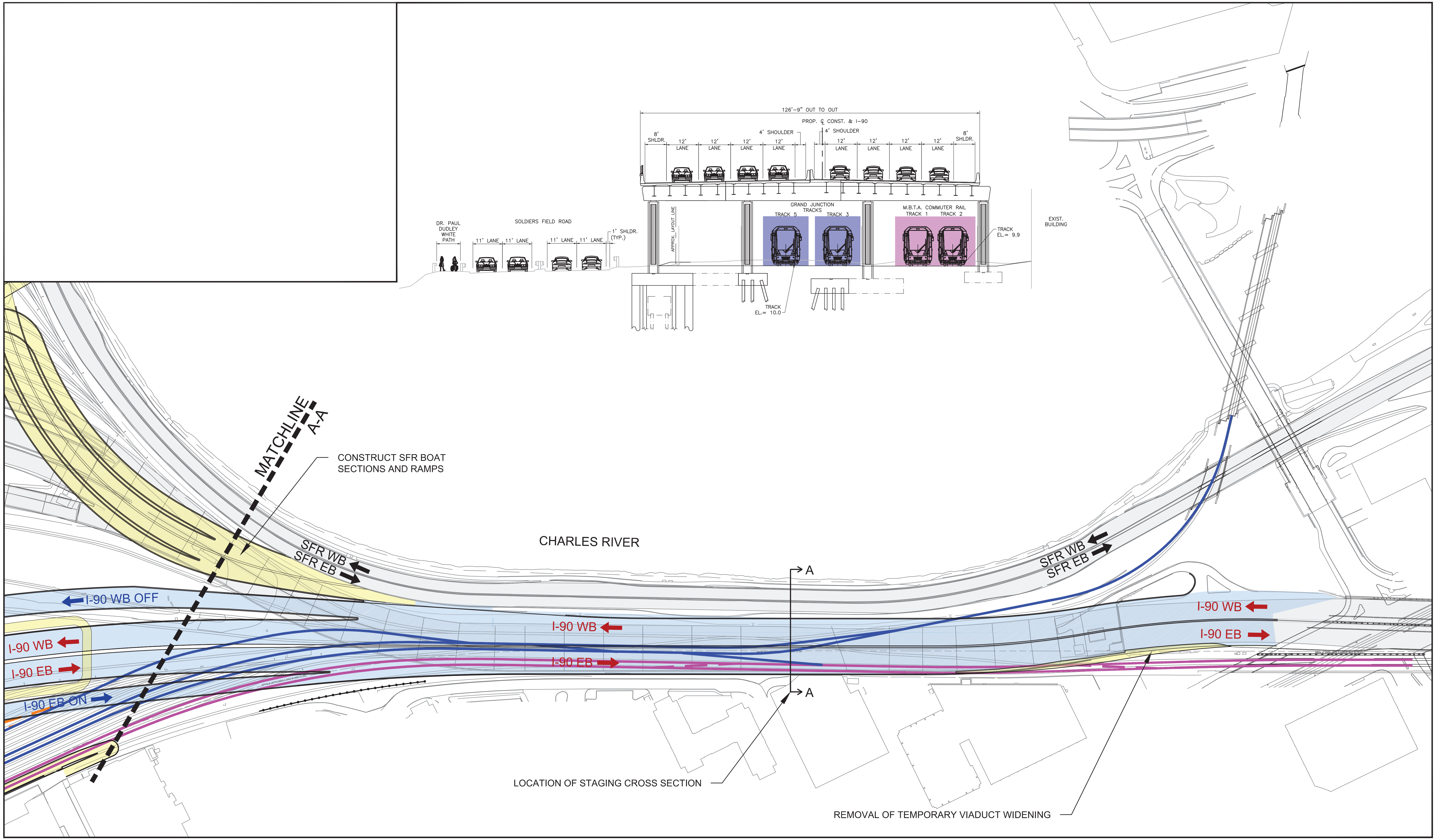
I-90 Urban Interchange, 3K-HV
Construction Stage 3

FIGURE
5.21-6




TRACK 1
TRACK 2
TRACK
EL.= 9.9
11' LANE
EXIST.
UILDING

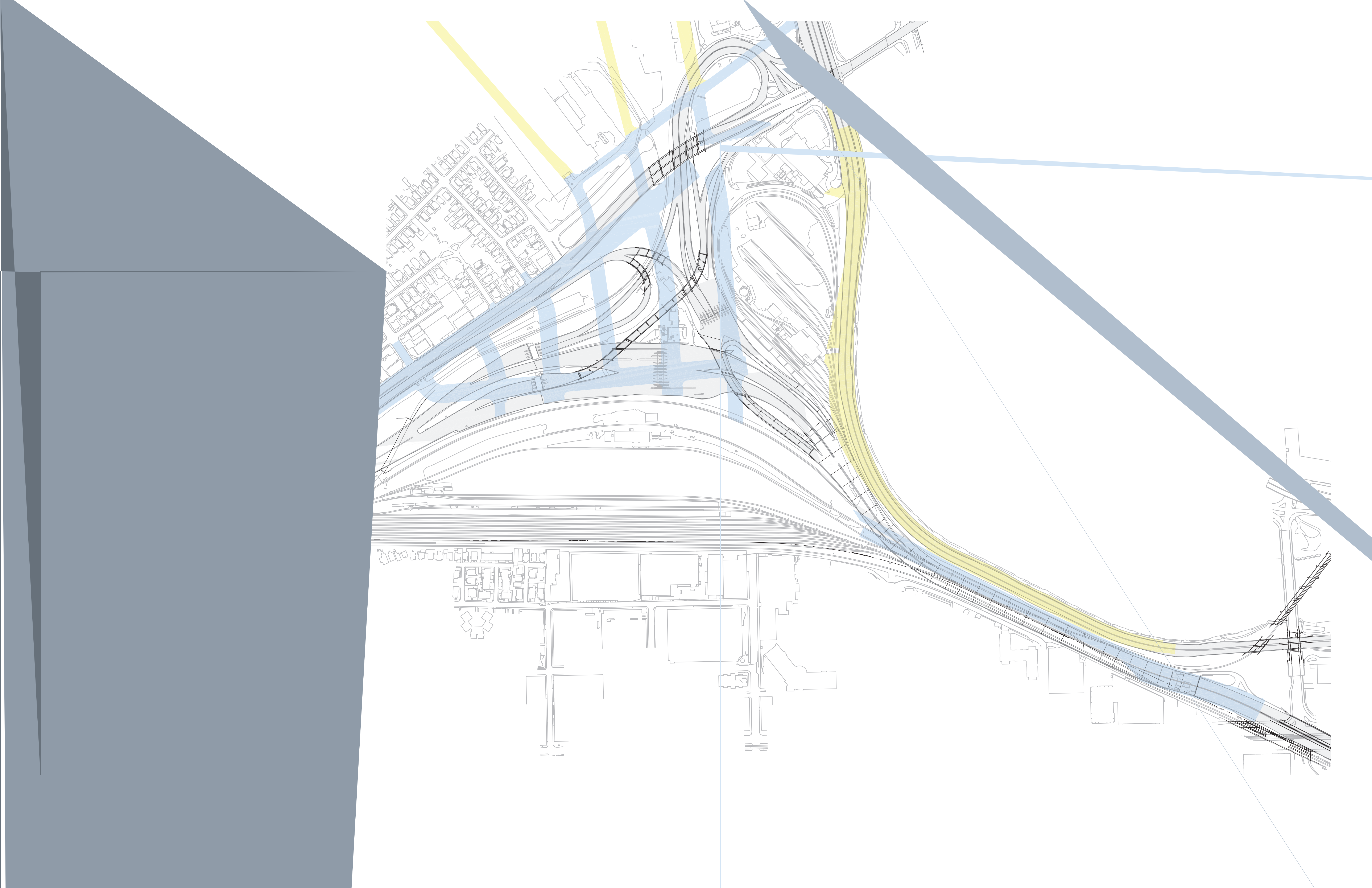



126'–9" OUT TO OUT
PROP. ℄ CONST. & I–90
4' SHOULDER
4' SHOULDER
8' SHLDR.
12' LANE
12' LANE
12' LANE
12' LANE
12' LANE
12' LANE
12' LANE
12' LANE
8' SHLDR.
DR. PAUL DUDLEY WHITE PATH
SOLDIERS FIELD ROAD
11' LANE
11' LANE
11' LANE
11' LANE
1' SHLDR. (TYP.)
APPROX. LAYOUT LINE
GRAND JUNCTION TRACKS
TRACK 5
TRACK 3
M.B.T.A. COMMUTER RAIL
TRACK 1
TRACK 2
TRACK EL.= 9.9
EXIST. BUILDING
TRACK EL.= 10.0
MATCHLINE A-A
CONSTRUCT SFR BOAT SECTIONS AND RAMPS
CHARLES RIVER
SFR WB
SFR EB
SFR WB
SFR EB
I-90 WB OFF
I-90 WB
I-90 EB
I-90 EB ON
I-90 WB
I-90 EB
I-90 WB
I-90 EB
A
A
LOCATION OF STAGING CROSS SECTION
REMOVAL OF TEMPORARY VIADUCT WIDENING
N
0
100
200
Feet

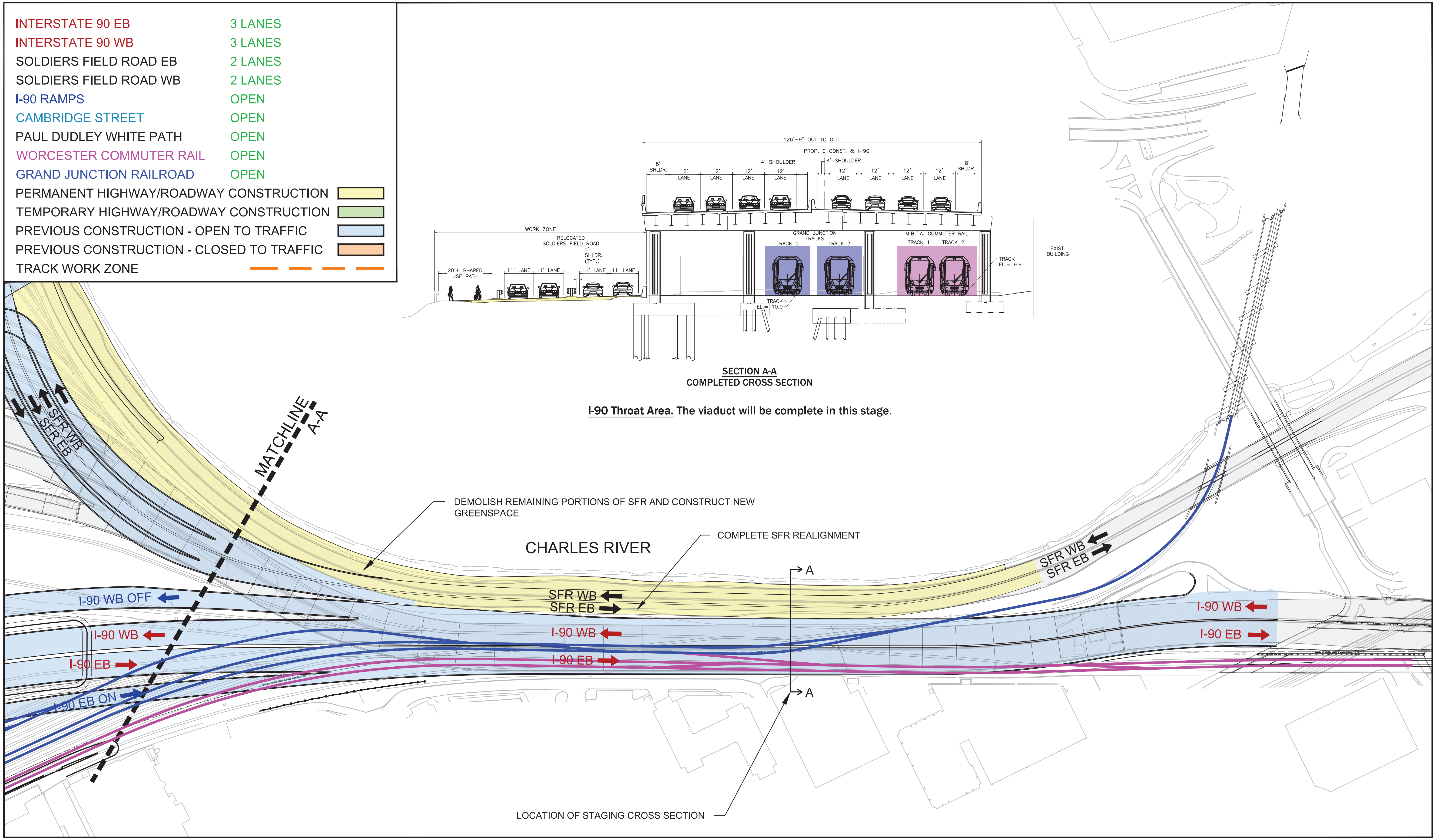
I-90 Allston Interchange Project
Draft Environmental Impact Report

I-90 Urban Interchange, 3K-HV Constructio

FIGURE
5.21-10



INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	OPEN
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	OPEN
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	– – – –


126'-9" OUT TO OUT
PROP. ℄ CONST. & I-90
4' SHOULDER
4' SHOULDER
8' SHLDR.
12' LANE
12' LANE
12' LANE
12' LANE
12' LANE
12' LANE
12' LANE
12' LANE
8' SHLDR.
WORK ZONE
RELOCATED SOLDIERS FIELD ROAD
1' SHLDR. (TYP.)
20'± SHARED USE PATH
11' LANE
11' LANE
11' LANE
11' LANE
GRAND JUNCTION TRACKS
TRACK 5
TRACK 3
M.B.T.A. COMMUTER RAIL
TRACK 1
TRACK 2
TRACK EL.= 9.9
TRACK EL.= 10.0
EXIST. BUILDING
SFR WB
SFR EB
MATCHLINE A-A
CHARLES RIVER
SFR WB
SFR EB
SFR WB
SFR EB
I-90 WB OFF
I-90 WB
I-90 EB
I-90 EB ON
I-90 WB
I-90 EB
I-90 WB
I-90 EB
A
A
0
100
200
Feet

SECTION A-A
COMPLETED CROSS SECTION

I-90 Throat Area. The viaduct will be complete in this stage.

DEMOLISH REMAINING PORTIONS OF SFR AND CONSTRUCT NEW GREENSPACE

COMPLETE SFR REALIGNMENT

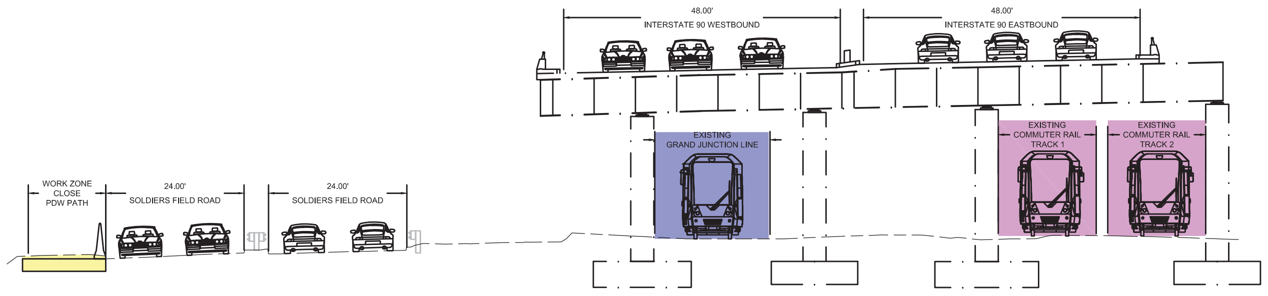
LOCATION OF STAGING CROSS SECTION

I-90 Allston Interchange Project
Draft Environmental Impact Report

I-90 Urban Interchange, 3K-HV
Construction Stage 6

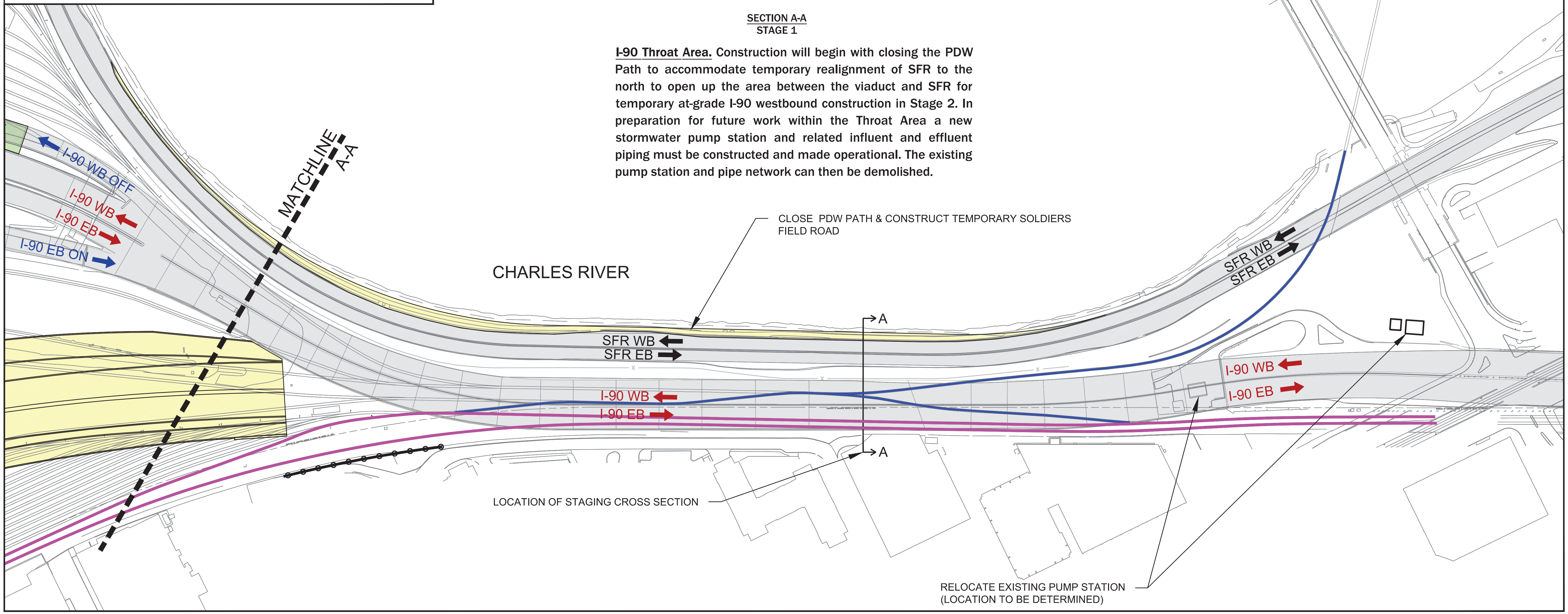
FIGURE
5.21-12

INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	CLOSED
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	OPEN
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	– – – –


48.00'
INTERSTATE 90 WESTBOUND
48.00'
INTERSTATE 90 EASTBOUND
EXISTING GRAND JUNCTION LINE
EXISTING COMMUTER RAIL TRACK 1
EXISTING COMMUTER RAIL TRACK 2
WORK ZONE CLOSE PDW PATH
24.00'
SOLDIERS FIELD ROAD
24.00'
SOLDIERS FIELD ROAD

SECTION A-A
STAGE 1

I-90 Throat Area. Construction will begin with closing the PDW Path to accommodate temporary realignment of SFR to the north to open up the area between the viaduct and SFR for temporary at-grade I-90 westbound construction in Stage 2. In preparation for future work within the Throat Area a new stormwater pump station and related influent and effluent piping must be constructed and made operational. The existing pump station and pipe network can then be demolished.


I-90 WB OFF
I-90 WB
I-90 EB
I-90 EB ON
MATCHLINE A-A
CHARLES RIVER
CLOSE PDW PATH & CONSTRUCT TEMPORARY SOLDIERS FIELD ROAD
SFR WB
SFR EB
SFR WB
SFR EB
A
A
I-90 WB
I-90 EB
I-90 WB
I-90 EB
LOCATION OF STAGING CROSS SECTION
RELOCATE EXISTING PUMP STATION (LOCATION TO BE DETERMINED)
N
0
100
200
Feet

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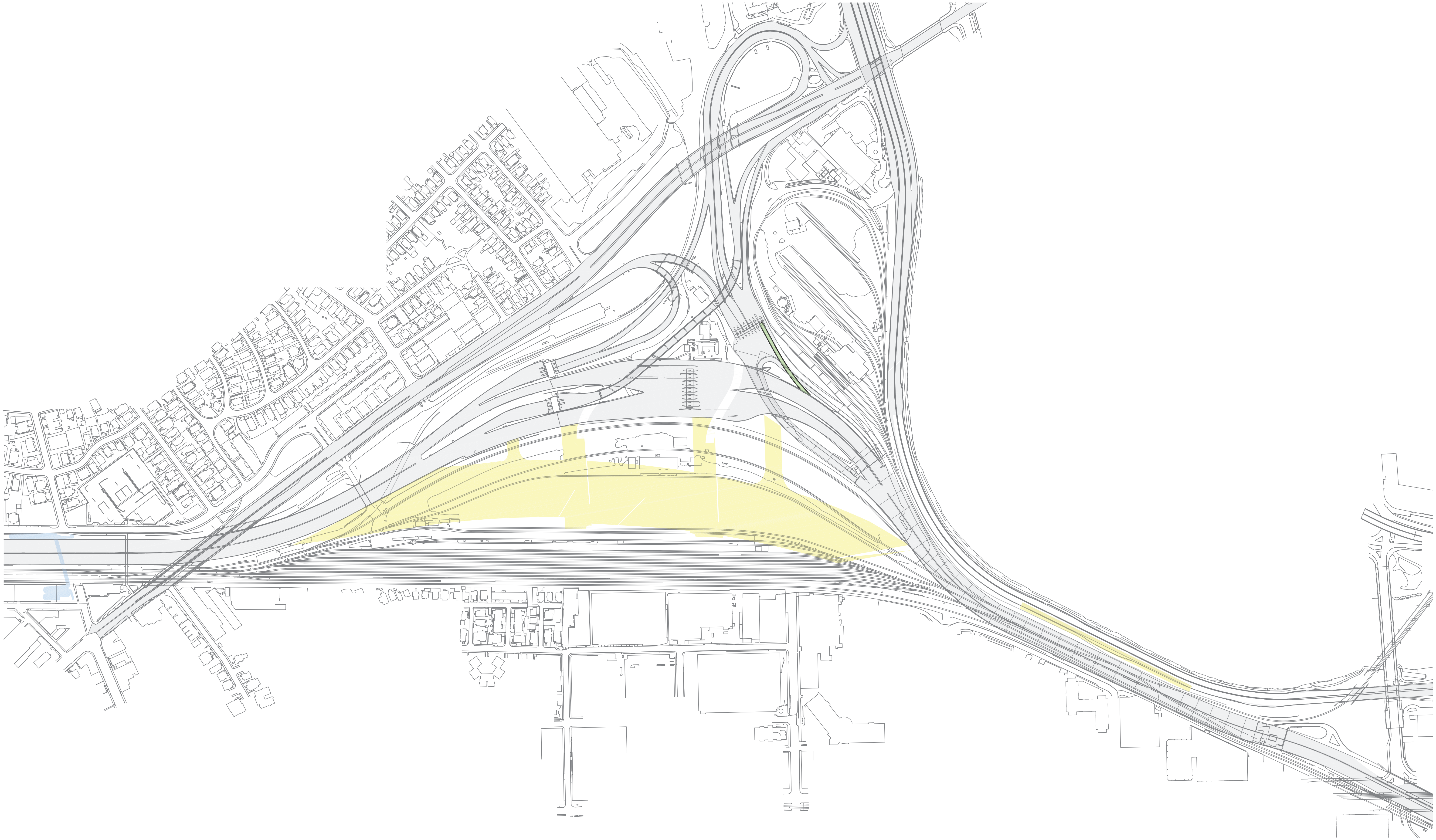
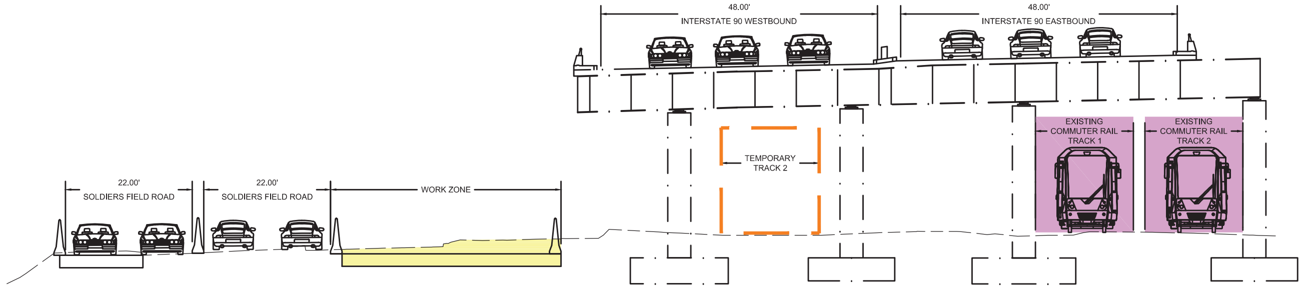
I-90 Urban Interchange, 3K-AMP
Construction Stage 1

FIGURE
5.21-14

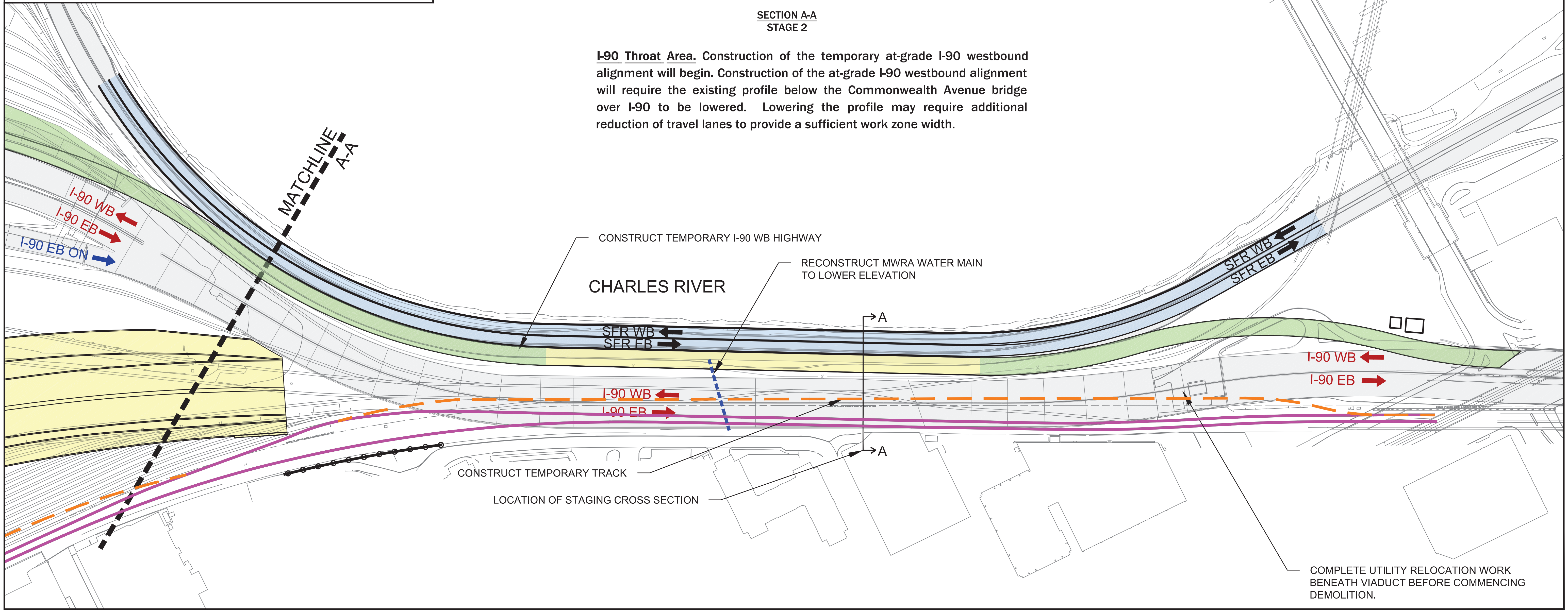


INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	CLOSED
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	– – – –


48.00'
INTERSTATE 90 WESTBOUND
48.00'
INTERSTATE 90 EASTBOUND
22.00'
SOLDIERS FIELD ROAD
22.00'
SOLDIERS FIELD ROAD
WORK ZONE
TEMPORARY TRACK 2
EXISTING COMMUTER RAIL TRACK 1
EXISTING COMMUTER RAIL TRACK 2

SECTION A-A
STAGE 2

I-90 Throat Area. Construction of the temporary at-grade I-90 westbound alignment will begin. Construction of the at-grade I-90 westbound alignment will require the existing profile below the Commonwealth Avenue bridge over I-90 to be lowered. Lowering the profile may require additional reduction of travel lanes to provide a sufficient work zone width.


MATCHLINE A-A
I-90 WB
I-90 EB
I-90 EB ON
CONSTRUCT TEMPORARY I-90 WB HIGHWAY
RECONSTRUCT MWRA WATER MAIN TO LOWER ELEVATION
CHARLES RIVER
SFR WB
SFR EB
SFR WB
SFR EB
A
A
I-90 WB
I-90 EB
I-90 WB
I-90 EB
CONSTRUCT TEMPORARY TRACK
LOCATION OF STAGING CROSS SECTION
COMPLETE UTILITY RELOCATION WORK BENEATH VIADUCT BEFORE COMMENCING DEMOLITION.
N
0
100
200
Feet

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I-90 Urban Interchange, 3K-AMP Construction Stage 2

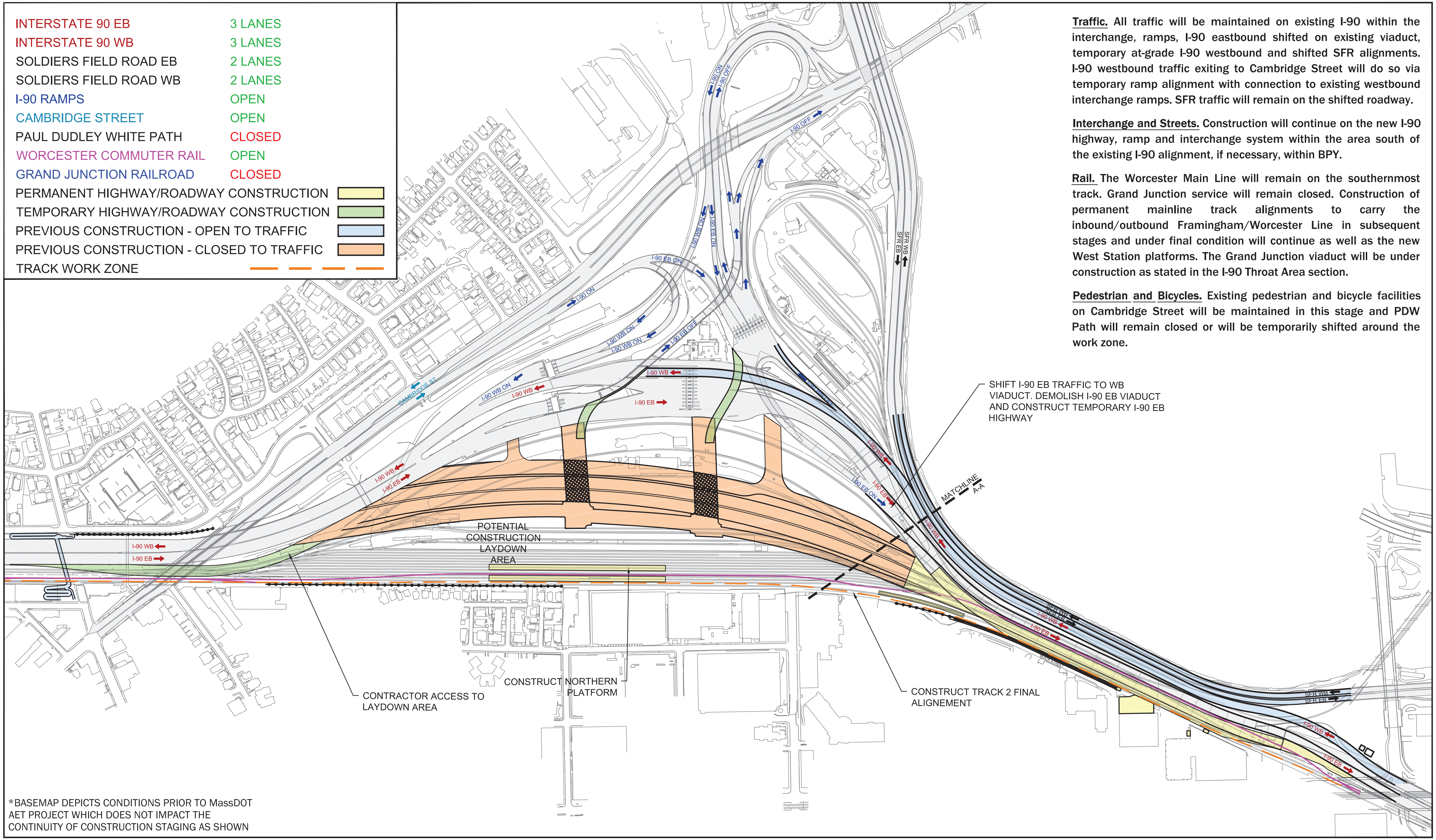
FIGURE
5.21-16

Traffic. All traffic will be maintained on existing I-90 within the interchange, ramps, I-90 eastbound shifted on existing viaduct, temporary at-grade I-90 westbound and shifted SFR alignments. I-90 westbound traffic exiting to Cambridge Street will do so via temporary ramp alignment with connection to existing westbound interchange ramps. SFR traffic will remain on the shifted roadway.

Interchange and Streets. Construction will continue on the new I-90 highway, ramp and interchange system within the area south of the existing I-90 alignment, if necessary, within BPY.

Rail. The Worcester Main Line will remain on the southernmost track. Grand Junction service will remain closed. Construction of permanent mainline track alignments to carry the inbound/outbound Framingham/Worcester Line in subsequent stages and under final condition will continue as well as the new West Station platforms. The Grand Junction viaduct will be under construction as stated in the I-90 Throat Area section.

Pedestrian and Bicycles. Existing pedestrian and bicycle facilities on Cambridge Street will be maintained in this stage and PDW Path will remain closed or will be temporarily shifted around the work zone.


I-90 ON
I-90 OFF
I-90 OFF
I-90 WB ON
I-90 EB ON
I-90 EB ON
SFR WB
SFR EB
I-90 ON
I-90 WB ON
I-90 WB ON
I-90 EB OFF
CAMBRIDGE ST
I-90 WB ON
I-90 WB
I-90 WB
I-90 EB
I-90 WB OFF
I-90 WB
I-90 EB ON
I-90 EB
I-90 WB
I-90 EB
I-90 WB
I-90 EB
MATCHLINE A-A
POTENTIAL CONSTRUCTION LAYDOWN AREA
SFR WB
SFR EB
I-90 WB
I-90 EB
BUICK STREET
SFR WB
SFR EB
I-90 WB
I-90 EB

INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	CLOSED
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	– – – –

SHIFT I-90 EB TRAFFIC TO WB VIADUCT. DEMOLISH I-90 EB VIADUCT AND CONSTRUCT TEMPORARY I-90 EB HIGHWAY

CONTRACTOR ACCESS TO LAYDOWN AREA

CONSTRUCT NORTHERN PLATFORM

CONSTRUCT TRACK 2 FINAL ALIGNEMENT

*BASEMAP DEPICTS CONDITIONS PRIOR TO MassDOT AET PROJECT WHICH DOES NOT IMPACT THE CONTINUITY OF CONSTRUCTION STAGING AS SHOWN

0 200 400
Feet

I-90 Allston Interchange Project
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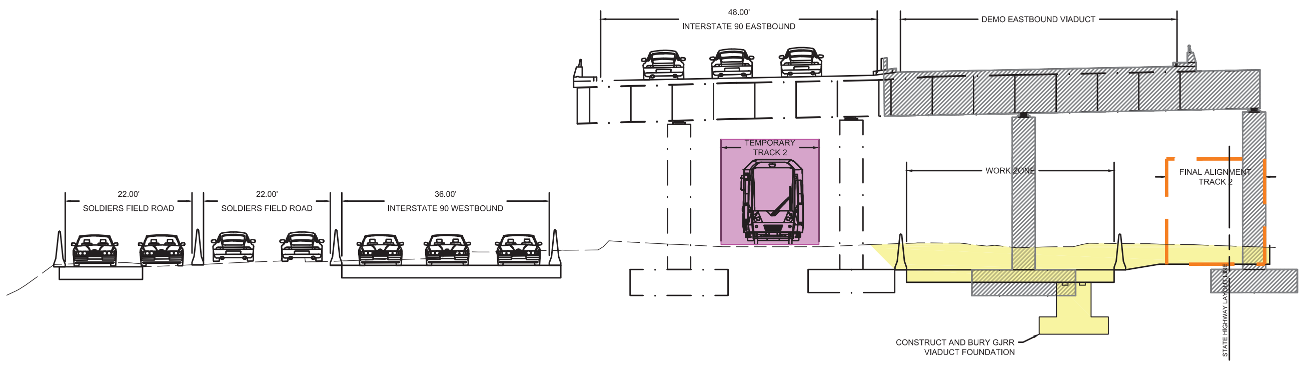
I-90 Urban Interchange, 3K-AMP
Construction Stage 3

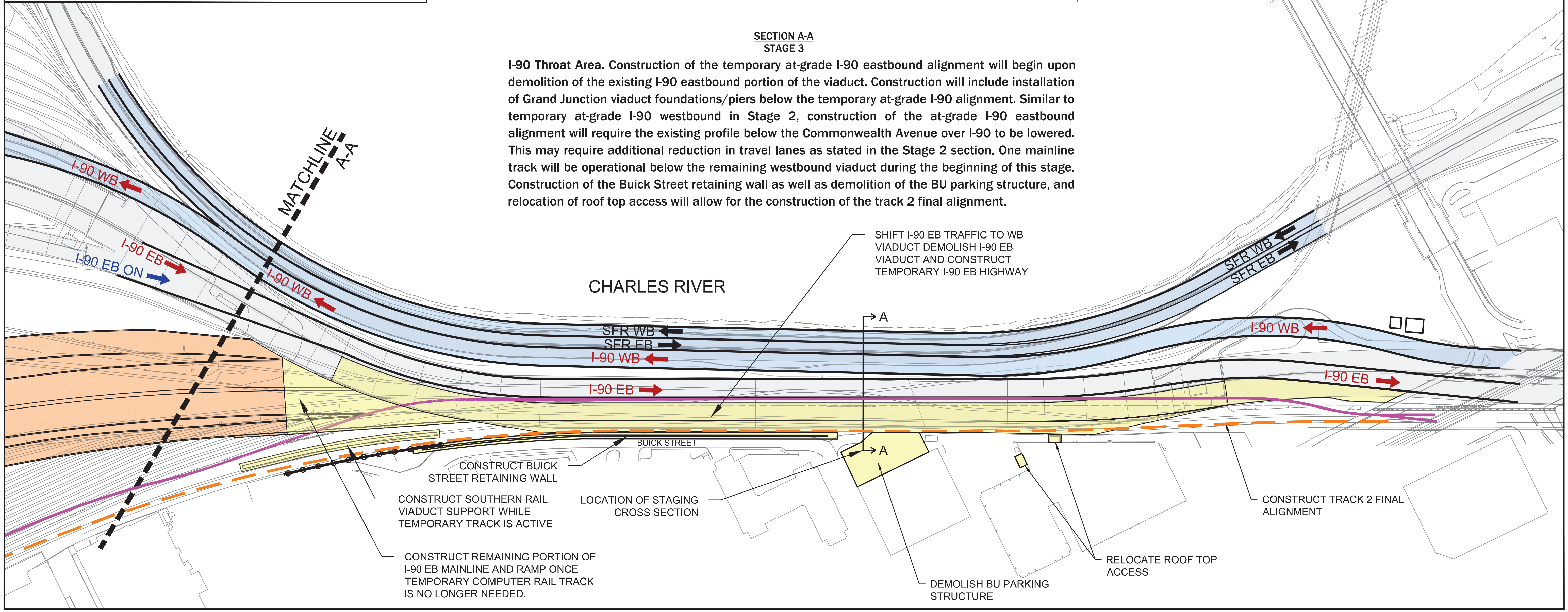
FIGURE
5.21-17

INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	CLOSED
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	– – –


48.00'
INTERSTATE 90 EASTBOUND
DEMO EASTBOUND VIADUCT
TEMPORARY TRACK 2
WORK ZONE
FINAL ALIGNMENT TRACK 2
22.00'
SOLDIERS FIELD ROAD
22.00'
SOLDIERS FIELD ROAD
36.00'
INTERSTATE 90 WESTBOUND
CONSTRUCT AND BURY GJRR VIADUCT FOUNDATION
STATE HIGHWAY LAYOUT LINE

SECTION A-A
STAGE 3

I-90 Throat Area. Construction of the temporary at-grade I-90 eastbound alignment will begin upon demolition of the existing I-90 eastbound portion of the viaduct. Construction will include installation of Grand Junction viaduct foundations/piers below the temporary at-grade I-90 alignment. Similar to temporary at-grade I-90 westbound in Stage 2, construction of the at-grade I-90 eastbound alignment will require the existing profile below the Commonwealth Avenue over I-90 to be lowered. This may require additional reduction in travel lanes as stated in the Stage 2 section. One mainline track will be operational below the remaining westbound viaduct during the beginning of this stage. Construction of the Buick Street retaining wall as well as demolition of the BU parking structure, and relocation of roof top access will allow for the construction of the track 2 final alignment.


MATCHLINE A-A
I-90 WB
I-90 EB
I-90 EB ON
I-90 WB
CHARLES RIVER
SFR WB
SFR EB
I-90 WB
I-90 EB
SFR WB
SFR EB
I-90 WB
I-90 EB
A
A
BUICK STREET

SHIFT I-90 EB TRAFFIC TO WB VIADUCT DEMOLISH I-90 EB VIADUCT AND CONSTRUCT TEMPORARY I-90 EB HIGHWAY

CONSTRUCT BUICK STREET RETAINING WALL

CONSTRUCT SOUTHERN RAIL VIADUCT SUPPORT WHILE TEMPORARY TRACK IS ACTIVE

LOCATION OF STAGING CROSS SECTION

CONSTRUCT REMAINING PORTION OF I-90 EB MAINLINE AND RAMP ONCE TEMPORARY COMPUTER RAIL TRACK IS NO LONGER NEEDED.

DEMOLISH BU PARKING STRUCTURE

RELOCATE ROOF TOP ACCESS

CONSTRUCT TRACK 2 FINAL ALIGNMENT

0 100 200
Feet

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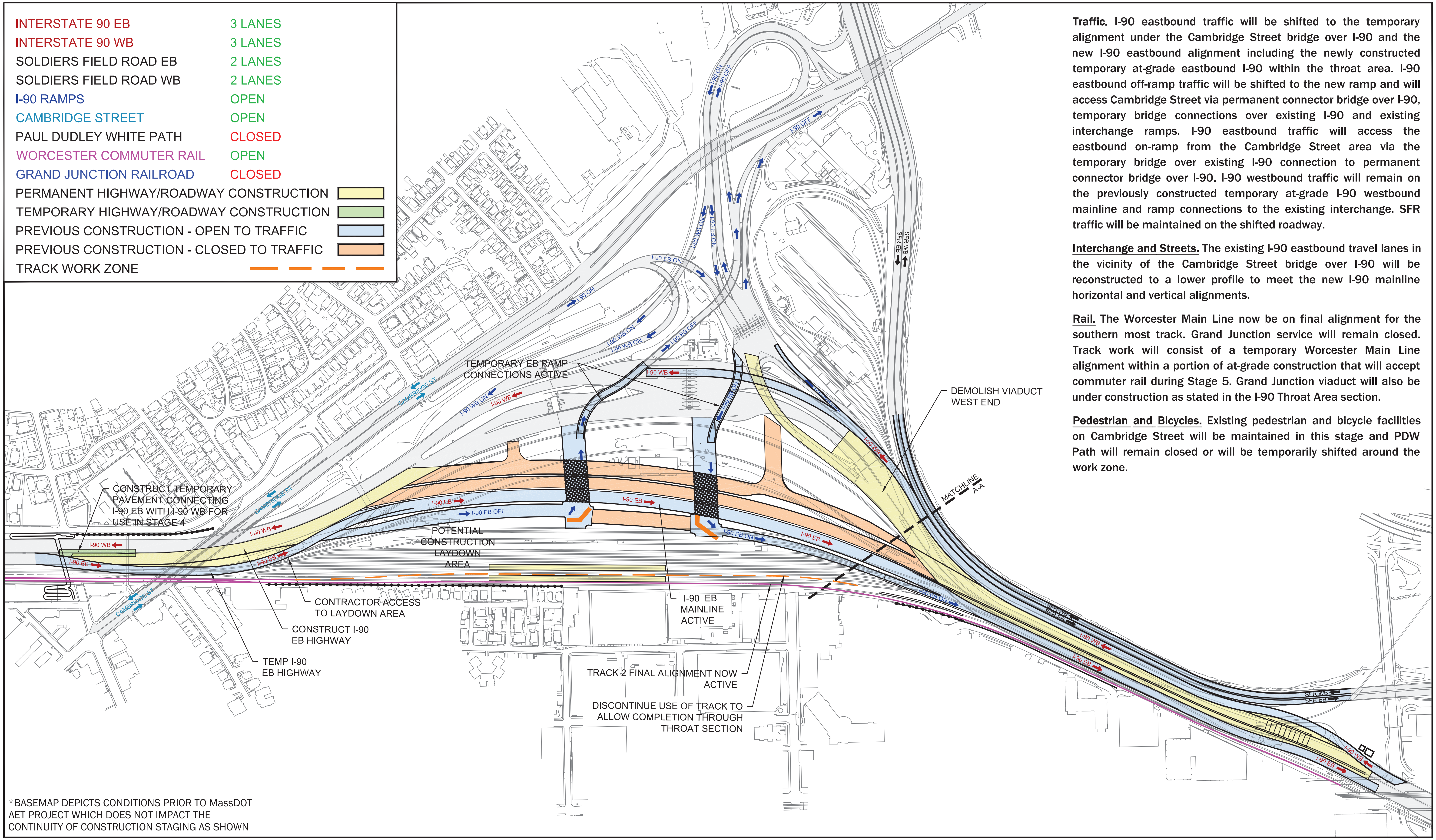
Draft Environmental Impact Report

I-90 Urban Interchange, 3K-AMP
Construction Stage 3

FIGURE
5.21-18



INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	CLOSED
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	— — —

TEMPORARY EB RAMP CONNECTIONS ACTIVE

DEMOLISH VIADUCT WEST END

CONSTRUCT TEMPORARY PAVEMENT CONNECTING I-90 EB WITH I-90 WB FOR USE IN STAGE 4

POTENTIAL CONSTRUCTION LAYDOWN AREA

CONTRACTOR ACCESS TO LAYDOWN AREA

CONSTRUCT I-90 EB HIGHWAY

TEMP I-90 EB HIGHWAY

I-90 EB MAINLINE ACTIVE

TRACK 2 FINAL ALIGNMENT NOW ACTIVE

DISCONTINUE USE OF TRACK TO ALLOW COMPLETION THROUGH THROAT SECTION

*BASEMAP DEPICTS CONDITIONS PRIOR TO MassDOT AET PROJECT WHICH DOES NOT IMPACT THE CONTINUITY OF CONSTRUCTION STAGING AS SHOWN

Traffic. I-90 eastbound traffic will be shifted to the temporary alignment under the Cambridge Street bridge over I-90 and the new I-90 eastbound alignment including the newly constructed temporary at-grade eastbound I-90 within the throat area. I-90 eastbound off-ramp traffic will be shifted to the new ramp and will access Cambridge Street via permanent connector bridge over I-90, temporary bridge connections over existing I-90 and existing interchange ramps. I-90 eastbound traffic will access the eastbound on-ramp from the Cambridge Street area via the temporary bridge over existing I-90 connection to permanent connector bridge over I-90. I-90 westbound traffic will remain on the previously constructed temporary at-grade I-90 westbound mainline and ramp connections to the existing interchange. SFR traffic will be maintained on the shifted roadway.

Interchange and Streets. The existing I-90 eastbound travel lanes in the vicinity of the Cambridge Street bridge over I-90 will be reconstructed to a lower profile to meet the new I-90 mainline horizontal and vertical alignments.

Rail. The Worcester Main Line now be on final alignment for the southern most track. Grand Junction service will remain closed. Track work will consist of a temporary Worcester Main Line alignment within a portion of at-grade construction that will accept commuter rail during Stage 5. Grand Junction viaduct will also be under construction as stated in the I-90 Throat Area section.

Pedestrian and Bicycles. Existing pedestrian and bicycle facilities on Cambridge Street will be maintained in this stage and PDW Path will remain closed or will be temporarily shifted around the work zone.

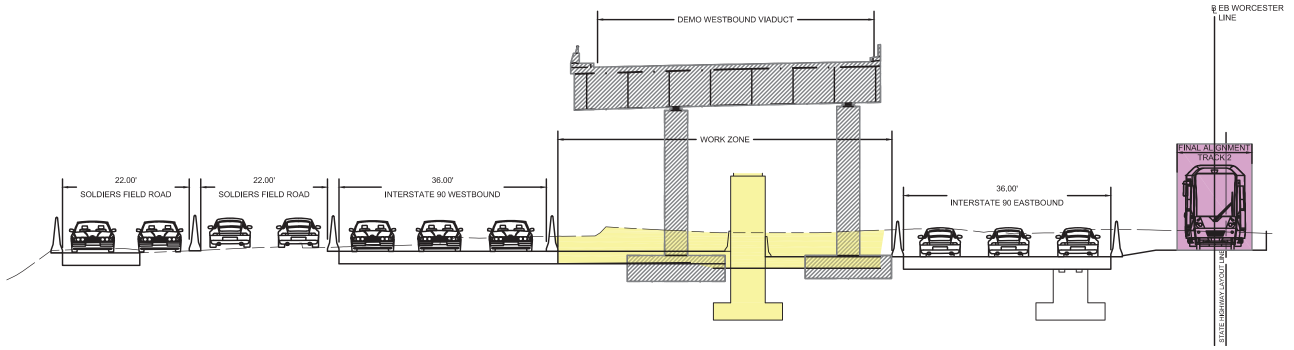
N

0 200 400
Feet

I-90 Urban Interchange, 3K-AMP
Construction Stage 4

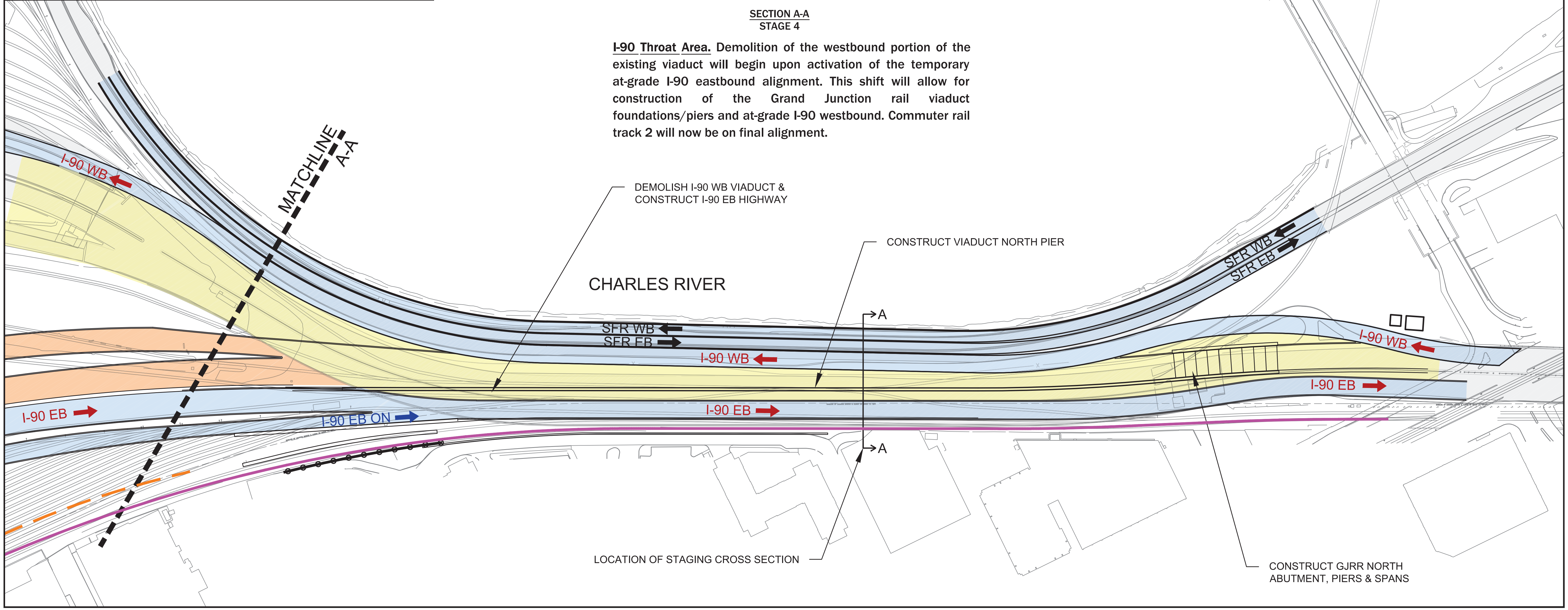
FIGURE
5.21-19

INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	CLOSED
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	— — — —


DEMO WESTBOUND VIADUCT
℄ EB WORCESTER LINE
WORK ZONE
FINAL ALIGNMENT TRACK 2
22.00'
SOLDIERS FIELD ROAD
22.00'
SOLDIERS FIELD ROAD
36.00'
INTERSTATE 90 WESTBOUND
36.00'
INTERSTATE 90 EASTBOUND
STATE HIGHWAY LAYOUT LINE

SECTION A-A
STAGE 4

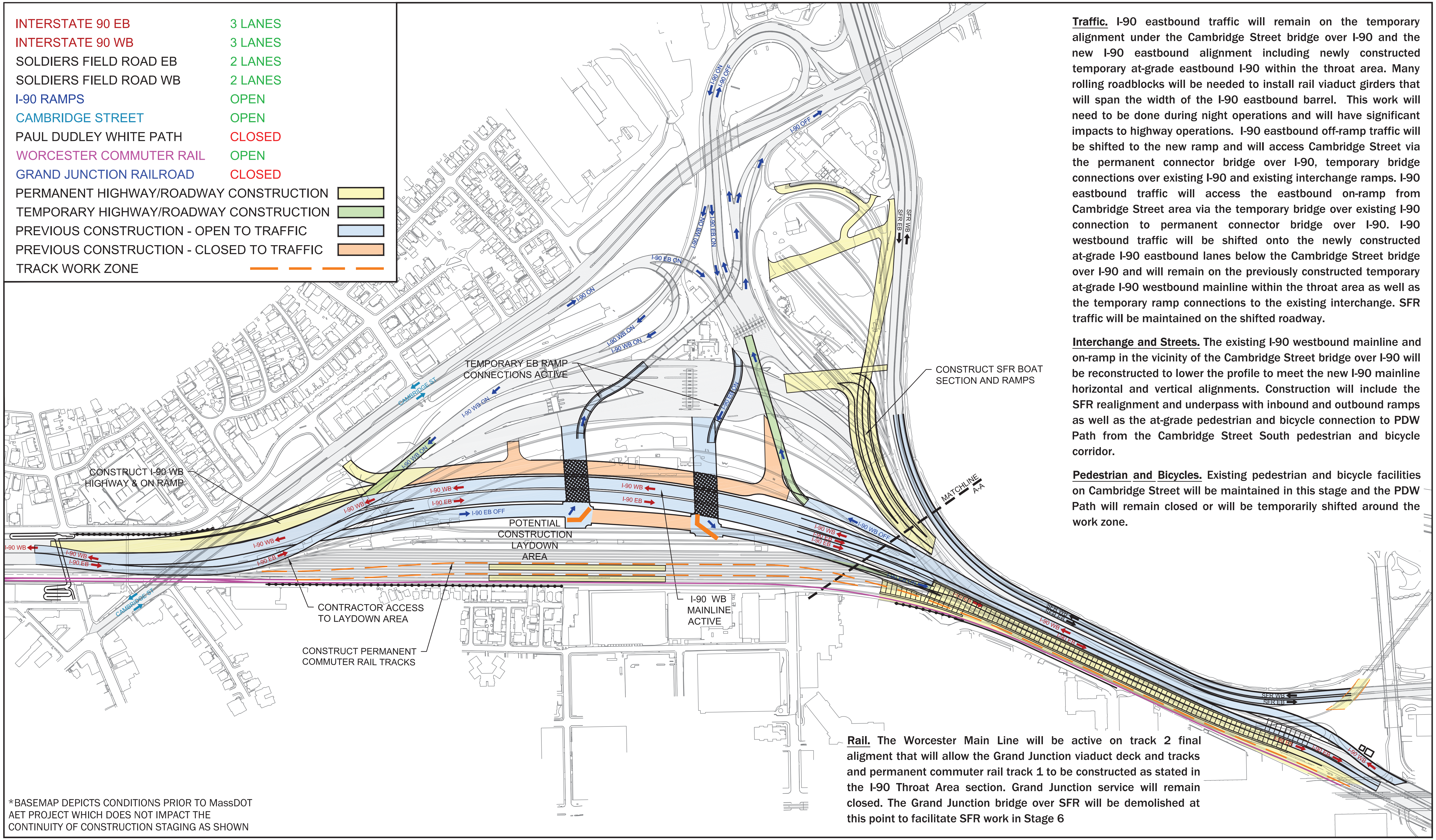
I-90 Throat Area. Demolition of the westbound portion of the existing viaduct will begin upon activation of the temporary at-grade I-90 eastbound alignment. This shift will allow for construction of the Grand Junction rail viaduct foundations/piers and at-grade I-90 westbound. Commuter rail track 2 will now be on final alignment.


MATCHLINE A-A
I-90 WB
DEMOLISH I-90 WB VIADUCT & CONSTRUCT I-90 EB HIGHWAY
CONSTRUCT VIADUCT NORTH PIER
CHARLES RIVER
SFR WB
SFR EB
A
I-90 WB
SFR WB
SFR EB
I-90 WB
I-90 EB
I-90 EB
I-90 EB ON
I-90 EB
A
LOCATION OF STAGING CROSS SECTION
CONSTRUCT GJRR NORTH ABUTMENT, PIERS & SPANS
0
100
200
Feet
N

I-90 Allston Interchange Project
Draft Environmental Impact Report

I-90 Urban Interchange, 3K-AMP
Construction Stage 4

FIGURE
5.21-20



INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	CLOSED
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	– – – –

TEMPORARY EB RAMP CONNECTIONS ACTIVE
CONSTRUCT SFR BOAT SECTION AND RAMPS
CONSTRUCT I-90 WB HIGHWAY & ON RAMP
POTENTIAL CONSTRUCTION LAYDOWN AREA
CONTRACTOR ACCESS TO LAYDOWN AREA
I-90 WB MAINLINE ACTIVE
CONSTRUCT PERMANENT COMMUTER RAIL TRACKS
MATCHLINE A-A
I-90 ON
I-90 OFF
I-90 WB ON
I-90 EB ON
I-90 EB OFF
I-90 WB OFF
I-90 WB
I-90 EB
SFR EB
SFR WB
CAMBRIDGE ST

Traffic. I-90 eastbound traffic will remain on the temporary alignment under the Cambridge Street bridge over I-90 and the new I-90 eastbound alignment including newly constructed temporary at-grade eastbound I-90 within the throat area. Many rolling roadblocks will be needed to install rail viaduct girders that will span the width of the I-90 eastbound barrel. This work will need to be done during night operations and will have significant impacts to highway operations. I-90 eastbound off-ramp traffic will be shifted to the new ramp and will access Cambridge Street via the permanent connector bridge over I-90, temporary bridge connections over existing I-90 and existing interchange ramps. I-90 eastbound traffic will access the eastbound on-ramp from Cambridge Street area via the temporary bridge over existing I-90 connection to permanent connector bridge over I-90. I-90 westbound traffic will be shifted onto the newly constructed at-grade I-90 eastbound lanes below the Cambridge Street bridge over I-90 and will remain on the previously constructed temporary at-grade I-90 westbound mainline within the throat area as well as the temporary ramp connections to the existing interchange. SFR traffic will be maintained on the shifted roadway.

Interchange and Streets. The existing I-90 westbound mainline and on-ramp in the vicinity of the Cambridge Street bridge over I-90 will be reconstructed to lower the profile to meet the new I-90 mainline horizontal and vertical alignments. Construction will include the SFR realignment and underpass with inbound and outbound ramps as well as the at-grade pedestrian and bicycle connection to PDW Path from the Cambridge Street South pedestrian and bicycle corridor.

Pedestrian and Bicycles. Existing pedestrian and bicycle facilities on Cambridge Street will be maintained in this stage and the PDW Path will remain closed or will be temporarily shifted around the work zone.

Rail. The Worcester Main Line will be active on track 2 final alignment that will allow the Grand Junction viaduct deck and tracks and permanent commuter rail track 1 to be constructed as stated in the I-90 Throat Area section. Grand Junction service will remain closed. The Grand Junction bridge over SFR will be demolished at this point to facilitate SFR work in Stage 6

*BASEMAP DEPICTS CONDITIONS PRIOR TO MassDOT AET PROJECT WHICH DOES NOT IMPACT THE CONTINUITY OF CONSTRUCTION STAGING AS SHOWN

0 200 400
Feet

I-90 Allston Interchange Project
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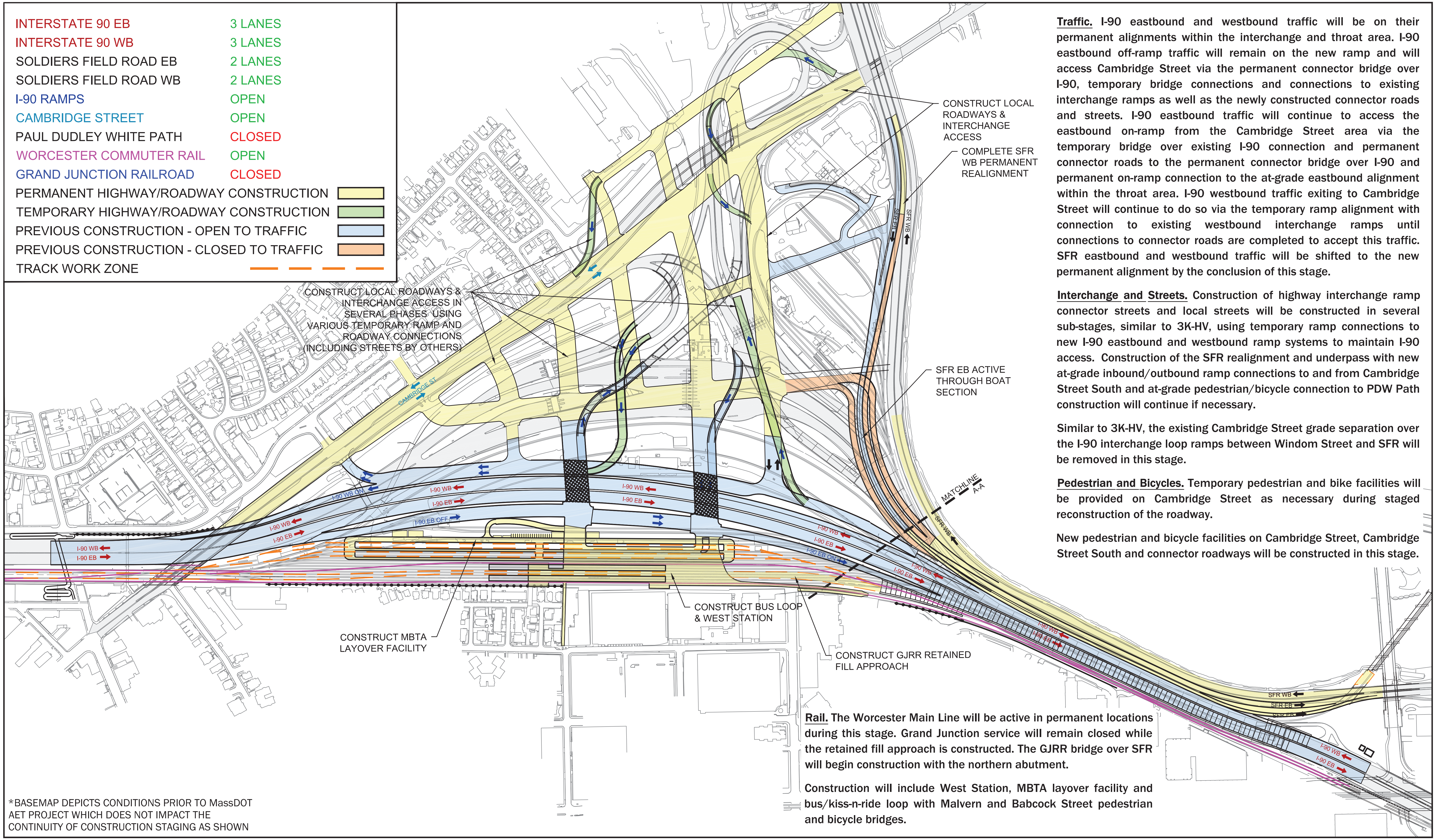
I-90 Urban Interchange, 3K-AMP
Construction Stage 5

FIGURE
5.21-21


CONSTRUCT LOCAL ROADWAYS & INTERCHANGE ACCESS
COMPLETE SFR WB PERMANENT REALIGNMENT
CONSTRUCT LOCAL ROADWAYS & INTERCHANGE ACCESS IN SEVERAL PHASES USING VARIOUS TEMPORARY RAMP AND ROADWAY CONNECTIONS (INCLUDING STREETS BY OTHERS)
SFR EB ACTIVE THROUGH BOAT SECTION
CAMBRIDGE ST
MATCHLINE A-A
CONSTRUCT BUS LOOP & WEST STATION
CONSTRUCT MBTA LAYOVER FACILITY
CONSTRUCT GJRR RETAINED FILL APPROACH
I-90 WB
I-90 EB
I-90 WB ON
I-90 EB OFF
I-90 EB ON
SFR WB
SFR EB
0
200
400
Feet

INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	CLOSED
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	- - - -

Traffic. I-90 eastbound and westbound traffic will be on their permanent alignments within the interchange and throat area. I-90 eastbound off-ramp traffic will remain on the new ramp and will access Cambridge Street via the permanent connector bridge over I-90, temporary bridge connections and connections to existing interchange ramps as well as the newly constructed connector roads and streets. I-90 eastbound traffic will continue to access the eastbound on-ramp from the Cambridge Street area via the temporary bridge over existing I-90 connection and permanent connector roads to the permanent connector bridge over I-90 and permanent on-ramp connection to the at-grade eastbound alignment within the throat area. I-90 westbound traffic exiting to Cambridge Street will continue to do so via the temporary ramp alignment with connection to existing westbound interchange ramps until connections to connector roads are completed to accept this traffic. SFR eastbound and westbound traffic will be shifted to the new permanent alignment by the conclusion of this stage.

Interchange and Streets. Construction of highway interchange ramp connector streets and local streets will be constructed in several sub-stages, similar to 3K-HV, using temporary ramp connections to new I-90 eastbound and westbound ramp systems to maintain I-90 access. Construction of the SFR realignment and underpass with new at-grade inbound/outbound ramp connections to and from Cambridge Street South and at-grade pedestrian/bicycle connection to PDW Path construction will continue if necessary.

Similar to 3K-HV, the existing Cambridge Street grade separation over the I-90 interchange loop ramps between Windom Street and SFR will be removed in this stage.

Pedestrian and Bicycles. Temporary pedestrian and bike facilities will be provided on Cambridge Street as necessary during staged reconstruction of the roadway.

New pedestrian and bicycle facilities on Cambridge Street, Cambridge Street South and connector roadways will be constructed in this stage.

Rail. The Worcester Main Line will be active in permanent locations during this stage. Grand Junction service will remain closed while the retained fill approach is constructed. The GJRR bridge over SFR will begin construction with the northern abutment.

Construction will include West Station, MBTA layover facility and bus/kiss-n-ride loop with Malvern and Babcock Street pedestrian and bicycle bridges.

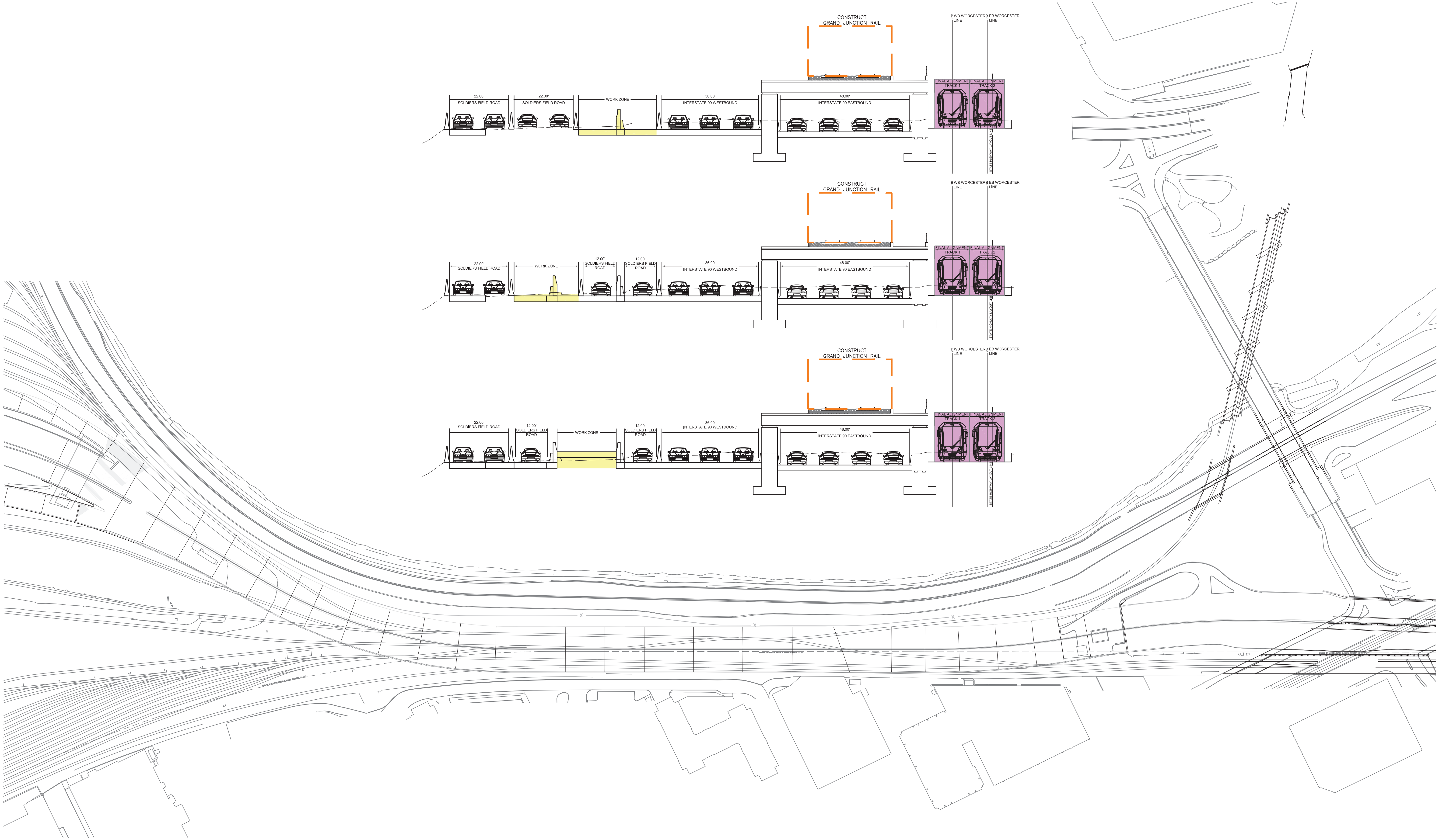
*BASEMAP DEPICTS CONDITIONS PRIOR TO MassDOT AET PROJECT WHICH DOES NOT IMPACT THE CONTINUITY OF CONSTRUCTION STAGING AS SHOWN

INTERSTATE 90 ALLSTON INTERCHANGE

massDOT Massachusetts Department of Transportation Highway Division

FIGURE 5.21-23

I-90 Urban Interchange, 3K-AMP Construction Stage 6


CONSTRUCT GRAND JUNCTION RAIL
℄ WB WORCESTER LINE
℄ EB WORCESTER LINE
22.00'
SOLDIERS FIELD ROAD
22.00'
SOLDIERS FIELD ROAD
WORK ZONE
36.00'
INTERSTATE 90 WESTBOUND
48.00'
INTERSTATE 90 EASTBOUND
FINAL ALIGNMENT TRACK 1
FINAL ALIGNMENT TRACK 2
STATE HIGHWAY LAYOUT LINE
CONSTRUCT GRAND JUNCTION RAIL
℄ WB WORCESTER LINE
℄ EB WORCESTER LINE
22.00'
SOLDIERS FIELD ROAD
WORK ZONE
12.00'
SOLDIERS FIELD ROAD
12.00'
SOLDIERS FIELD ROAD
36.00'
INTERSTATE 90 WESTBOUND
48.00'
INTERSTATE 90 EASTBOUND
FINAL ALIGNMENT TRACK 1
FINAL ALIGNMENT TRACK 2
STATE HIGHWAY LAYOUT LINE
CONSTRUCT GRAND JUNCTION RAIL
℄ WB WORCESTER LINE
℄ EB WORCESTER LINE
22.00'
SOLDIERS FIELD ROAD
12.00'
SOLDIERS FIELD ROAD
WORK ZONE
12.00'
SOLDIERS FIELD ROAD
36.00'
INTERSTATE 90 WESTBOUND
48.00'
INTERSTATE 90 EASTBOUND
FINAL ALIGNMENT TRACK 1
FINAL ALIGNMENT TRACK 2
STATE HIGHWAY LAYOUT LINE

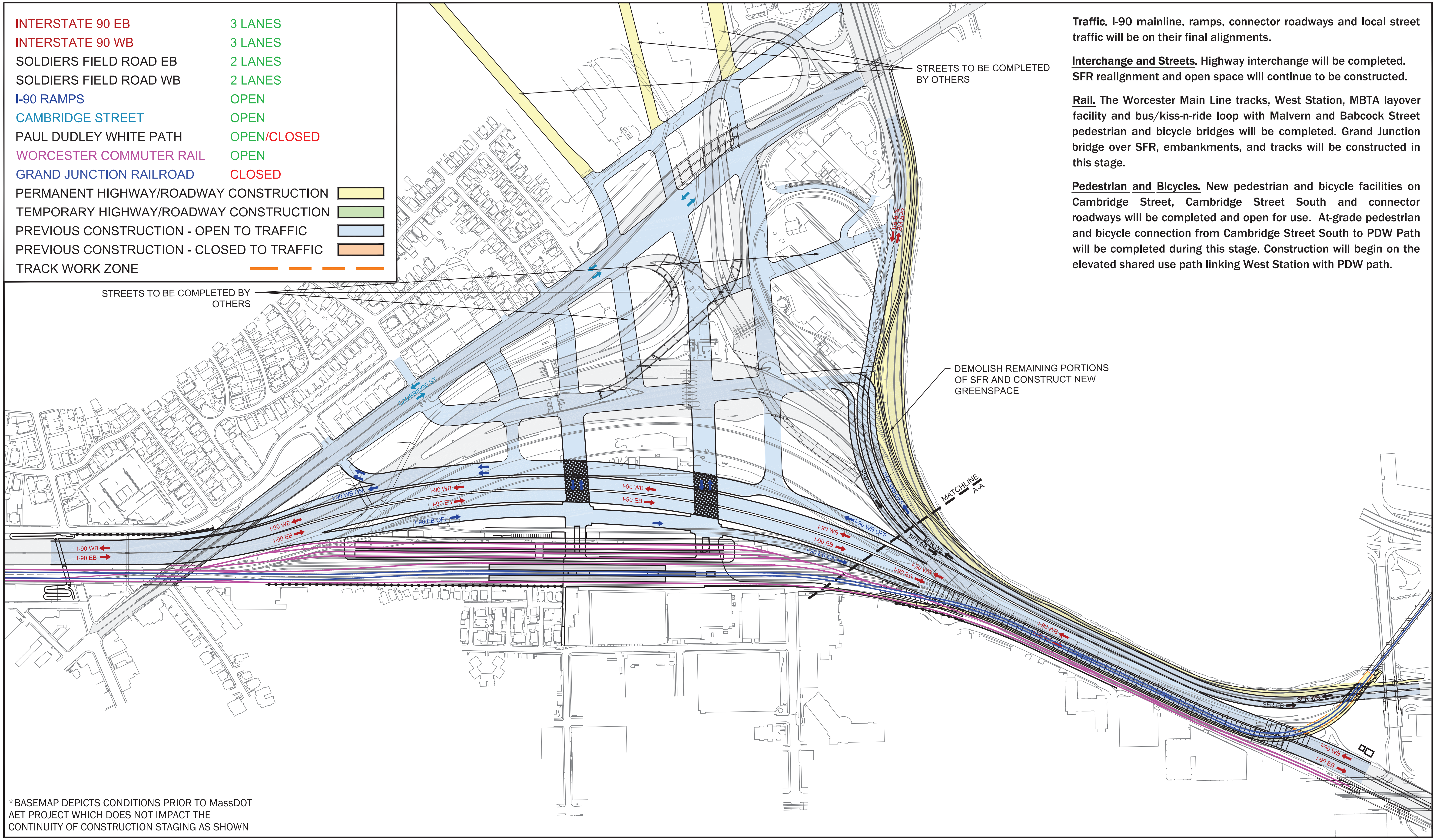
INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	OPEN/CLOSED
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	— — — —

Traffic. I-90 mainline, ramps, connector roadways and local street traffic will be on their final alignments.

Interchange and Streets. Highway interchange will be completed. SFR realignment and open space will continue to be constructed.

Rail. The Worcester Main Line tracks, West Station, MBTA layover facility and bus/kiss-n-ride loop with Malvern and Babcock Street pedestrian and bicycle bridges will be completed. Grand Junction bridge over SFR, embankments, and tracks will be constructed in this stage.

Pedestrian and Bicycles. New pedestrian and bicycle facilities on Cambridge Street, Cambridge Street South and connector roadways will be completed and open for use. At-grade pedestrian and bicycle connection from Cambridge Street South to PDW Path will be completed during this stage. Construction will begin on the elevated shared use path linking West Station with PDW path.



STREETS TO BE COMPLETED BY OTHERS

STREETS TO BE COMPLETED BY OTHERS

DEMOLISH REMAINING PORTIONS OF SFR AND CONSTRUCT NEW GREENSPACE

*BASEMAP DEPICTS CONDITIONS PRIOR TO MassDOT AET PROJECT WHICH DOES NOT IMPACT THE CONTINUITY OF CONSTRUCTION STAGING AS SHOWN

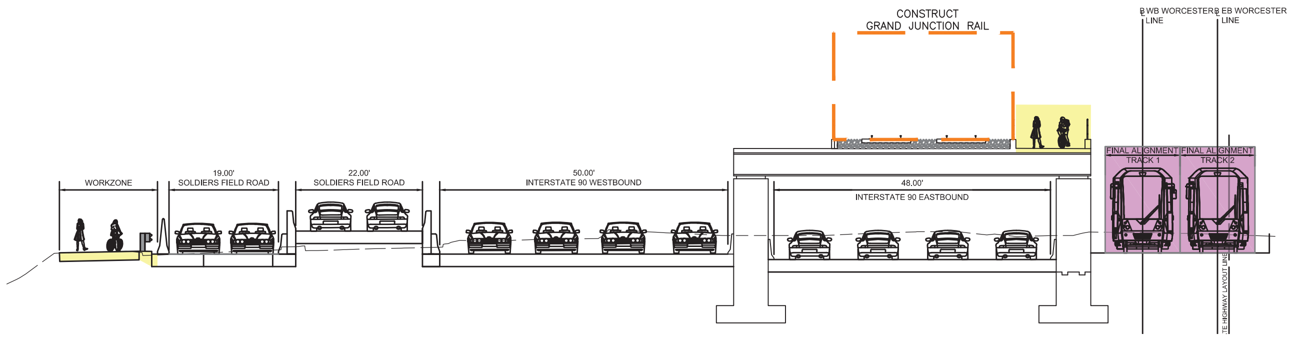
0 200 400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

I-90 Urban Interchange, 3K-AMP Construction Stage 7

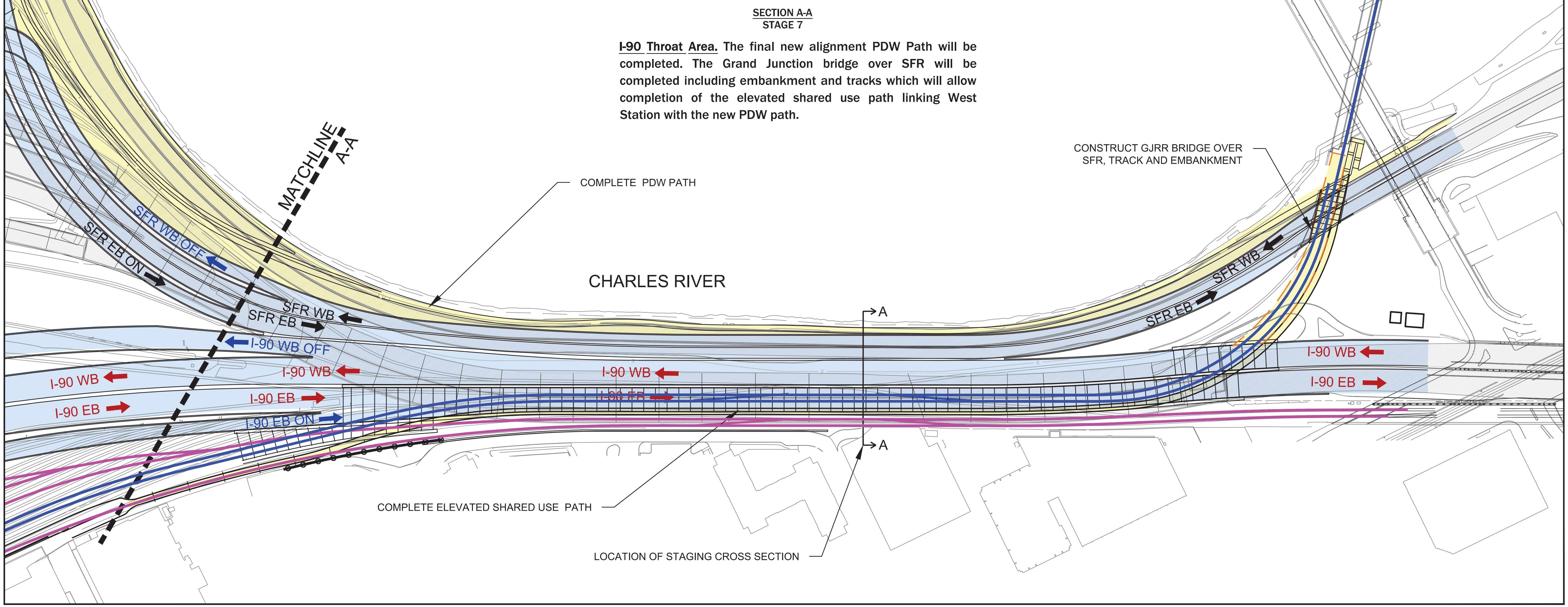
FIGURE
5.21-25

INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	OPEN/CLOSED
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	— — — —


CONSTRUCT
GRAND JUNCTION RAIL
℄ WB WORCESTER LINE
℄ EB WORCESTER LINE
WORKZONE
19.00'
SOLDIERS FIELD ROAD
22.00'
SOLDIERS FIELD ROAD
50.00'
INTERSTATE 90 WESTBOUND
48.00'
INTERSTATE 90 EASTBOUND
FINAL ALIGNMENT TRACK 1
FINAL ALIGNMENT TRACK 2
STATE HIGHWAY LAYOUT LINE

SECTION A-A
STAGE 7

I-90 Throat Area. The final new alignment PDW Path will be completed. The Grand Junction bridge over SFR will be completed including embankment and tracks which will allow completion of the elevated shared use path linking West Station with the new PDW path.


MATCHLINE A-A
SFR WB OFF
SFR EB ON
CHARLES RIVER
COMPLETE PDW PATH
CONSTRUCT GJRR BRIDGE OVER SFR, TRACK AND EMBANKMENT
SFR WB
SFR EB
SFR WB
SFR EB
I-90 WB OFF
I-90 WB
I-90 EB
I-90 WB
I-90 EB
I-90 EB ON
I-90 WB
I-90 EB
I-90 WB
I-90 EB
A
A
COMPLETE ELEVATED SHARED USE PATH
LOCATION OF STAGING CROSS SECTION

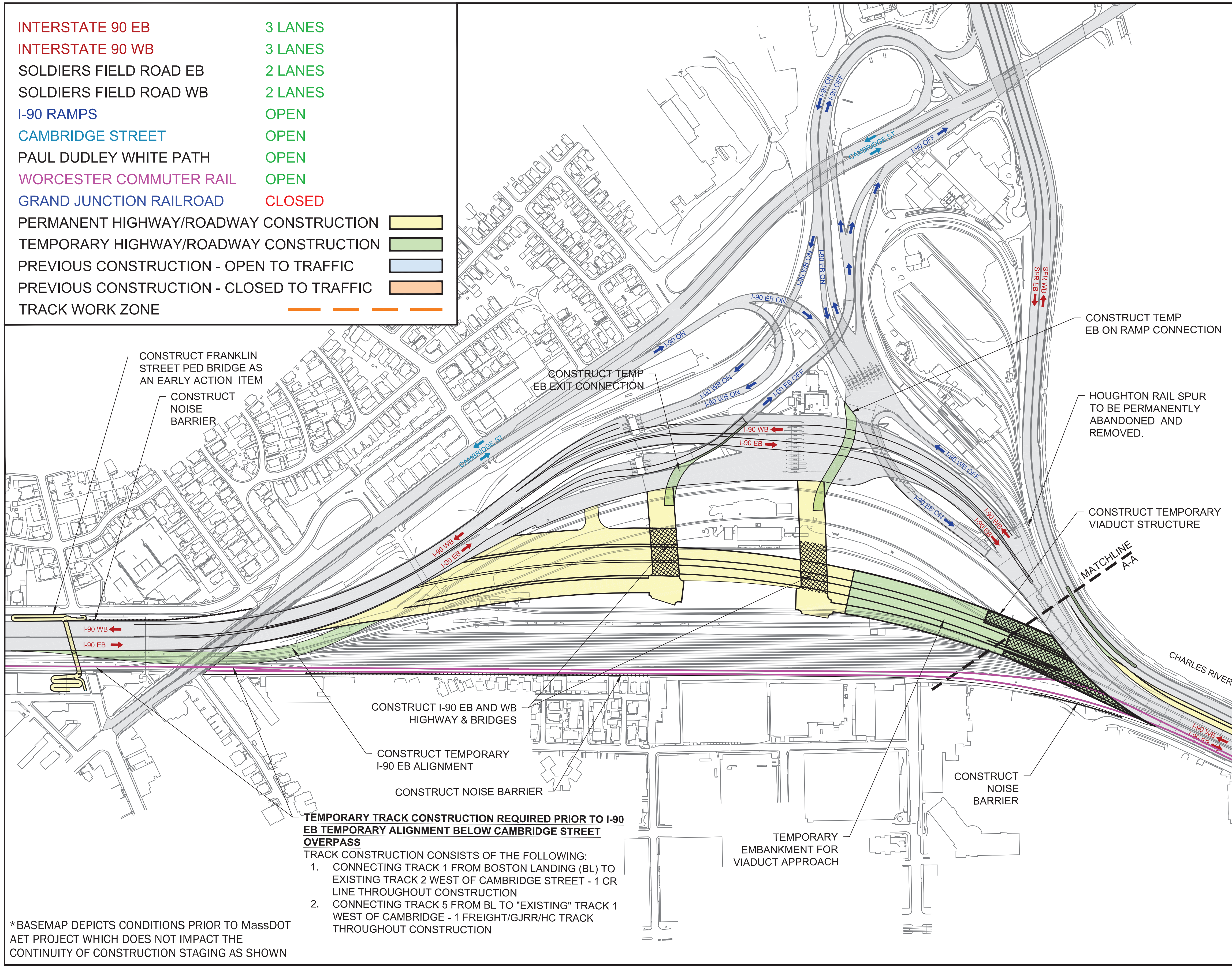
N
0 100 200
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

I-90 Urban Interchange, 3K-AMP
Construction Stage 7

FIGURE
5.21-26

INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	OPEN
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	— — — —


CONSTRUCT FRANKLIN STREET PED BRIDGE AS AN EARLY ACTION ITEM
CONSTRUCT NOISE BARRIER
CONSTRUCT TEMP EB EXIT CONNECTION
CONSTRUCT TEMP EB ON RAMP CONNECTION
HOUGHTON RAIL SPUR TO BE PERMANENTLY ABANDONED AND REMOVED.
CONSTRUCT TEMPORARY VIADUCT STRUCTURE
MATCHLINE A-A
CHARLES RIVER
CONSTRUCT I-90 EB AND WB HIGHWAY & BRIDGES
CONSTRUCT TEMPORARY I-90 EB ALIGNMENT
CONSTRUCT NOISE BARRIER
CONSTRUCT NOISE BARRIER
TEMPORARY EMBANKMENT FOR VIADUCT APPROACH
I-90 ON
I-90 OFF
CAMBRIDGE ST
I-90 OFF
I-90 WB ON
I-90 EB ON
I-90 EB ON
I-90 ON
I-90 WB ON
I-90 WB ON
I-90 EB OFF
I-90 WB
I-90 EB
I-90 WB OFF
I-90 EB ON
I-90 WB
I-90 EB
SFR WB
SFR EB
CAMBRIDGE ST
I-90 WB
I-90 EB
I-90 WB
I-90 EB
I-90 WB
I-90 EB
SFR WB
SFR EB
SFR WB
SFR EB
I-90 WB
I-90 EB

TEMPORARY TRACK CONSTRUCTION REQUIRED PRIOR TO I-90 EB TEMPORARY ALIGNMENT BELOW CAMBRIDGE STREET OVERPASS

TRACK CONSTRUCTION CONSISTS OF THE FOLLOWING:

1. CONNECTING TRACK 1 FROM BOSTON LANDING (BL) TO EXISTING TRACK 2 WEST OF CAMBRIDGE STREET - 1 CR LINE THROUGHOUT CONSTRUCTION
2. CONNECTING TRACK 5 FROM BL TO "EXISTING" TRACK 1 WEST OF CAMBRIDGE - 1 FREIGHT/GJRR/HC TRACK THROUGHOUT CONSTRUCTION

*BASEMAP DEPICTS CONDITIONS PRIOR TO MassDOT AET PROJECT WHICH DOES NOT IMPACT THE CONTINUITY OF CONSTRUCTION STAGING AS SHOWN

Traffic. All traffic will be maintained on existing I-90, ramp and SFR alignments.

Interchange and Streets. Construction will begin on the new I-90 highway, ramp and interchange system similar to Throat Area Variations 3K-HV and 3K-AMP. A portion of this highway construction will accept eastbound traffic in Stage 2.

Rail. The Worcester Main Line will be on the southernmost track. Grand Junction service will be closed in this stage and remain closed through stage 6. Other track work will consist of temporary track alignments and connections in the vicinity of the Cambridge Street bridge over I-90 to allow for construction of the temporary I-90 eastbound alignment that will be used in Stage 2.

Pedestrian and Bicycles. Existing pedestrian and bicycle facilities on Cambridge Street will be maintained in this stage.

The PDW Path will remain open during this stage. Similar to 3K-HV and 3K-AMP, a goal of the Project will be to construct the new Franklin Street Pedestrian Bridge in Stage 1.

Noise Barriers. Another goal of the project will be to construct the new noise barriers in stage 1 as early action items. Temporary track work will be required to allow construction vehicles and equipment access to the proposed wall locations within the rail yard. Construction of the new noise barrier at Nickerson Field may require full or partial replacement of the retaining wall along the property line.

Pump Station. A new pump station and associated piping will be constructed and made operational to allow for future demolition and removal of the existing pump station below the viaduct.

0 200 400
Feet

I-90 Allston Interchange Project
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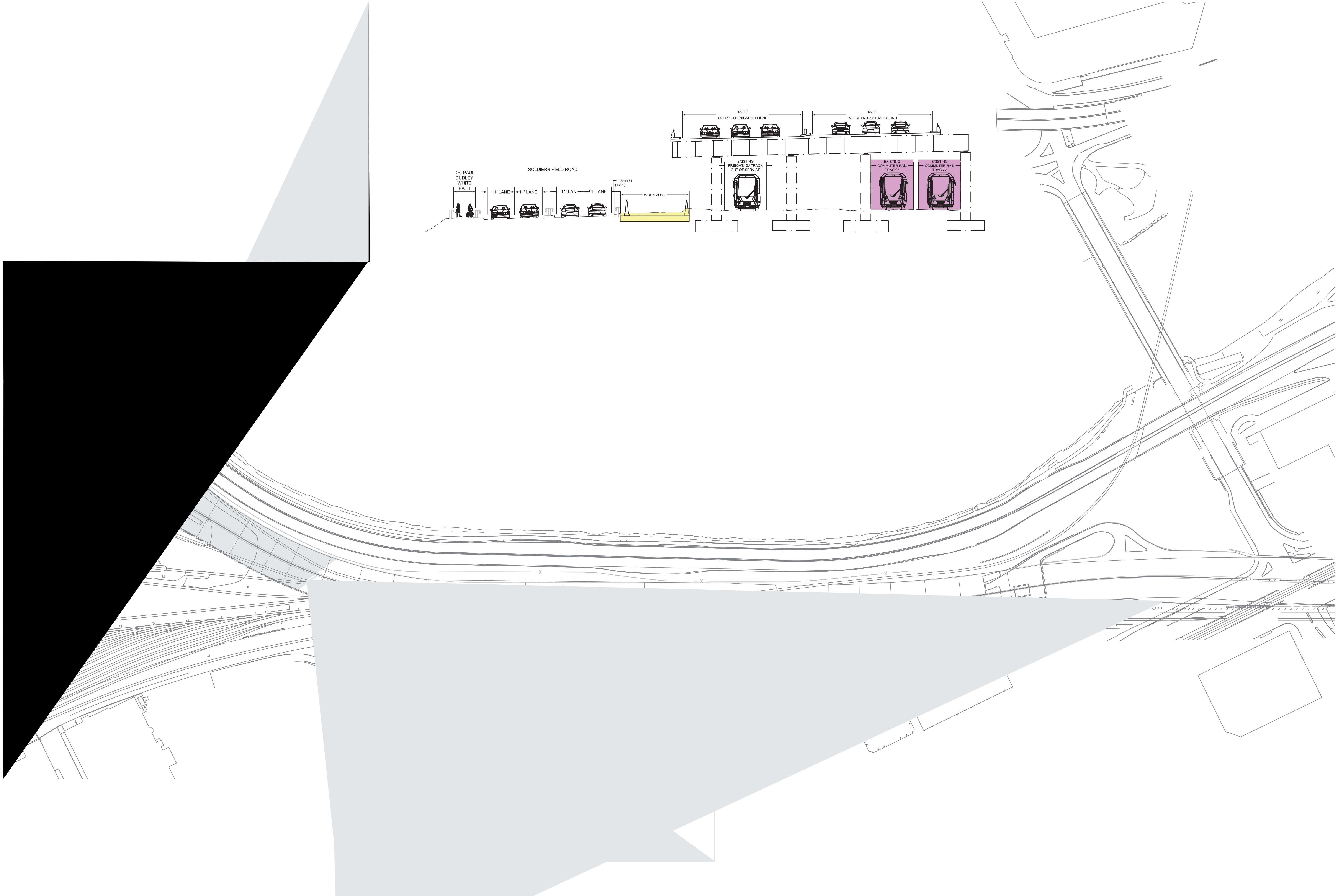
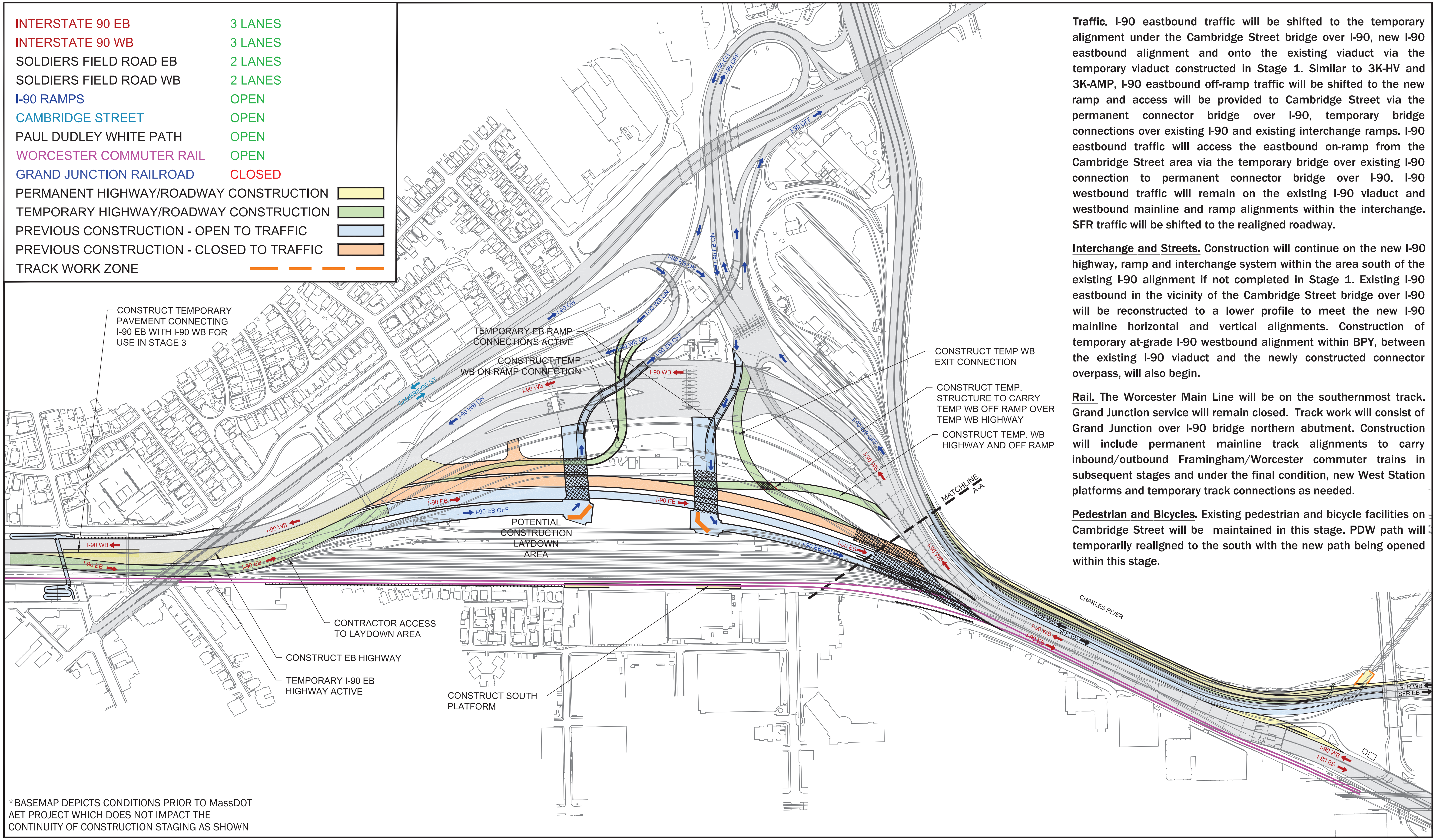
I-90 Urban Interchange, 3K-ABC
Construction Stage 1

FIGURE
5.21-27


SOLDIERS FIELD ROAD
DR. PAUL DUDLEY WHITE PATH
11' LANE
11' LANE
11' LANE
11' LANE
1' SHLDR. (TYP.)
WORK ZONE
48.00'
INTERSTATE 90 WESTBOUND
48.00'
INTERSTATE 90 EASTBOUND
EXISTING FREIGHT/ GJ TRACK OUT OF SERVICE
EXISTING COMMUTER RAIL TRACK 1
EXISTING COMMUTER RAIL TRACK 2


CONSTRUCT TEMPORARY PAVEMENT CONNECTING I-90 EB WITH I-90 WB FOR USE IN STAGE 3
TEMPORARY EB RAMP CONNECTIONS ACTIVE
CONSTRUCT TEMP WB ON RAMP CONNECTION
CONSTRUCT TEMP WB EXIT CONNECTION
CONSTRUCT TEMP. STRUCTURE TO CARRY TEMP WB OFF RAMP OVER TEMP WB HIGHWAY
CONSTRUCT TEMP. WB HIGHWAY AND OFF RAMP
POTENTIAL CONSTRUCTION LAYDOWN AREA
CONTRACTOR ACCESS TO LAYDOWN AREA
CONSTRUCT EB HIGHWAY
TEMPORARY I-90 EB HIGHWAY ACTIVE
CONSTRUCT SOUTH PLATFORM
MATCHLINE A-A
CHARLES RIVER
CAMBRIDGE ST
I-90 ON
I-90 OFF
I-90 WB ON
I-90 EB ON
I-90 WB OFF
I-90 EB OFF
I-90 WB
I-90 EB
SFR WB
SFR EB

INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	OPEN
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	— — — —

Traffic. I-90 eastbound traffic will be shifted to the temporary alignment under the Cambridge Street bridge over I-90, new I-90 eastbound alignment and onto the existing viaduct via the temporary viaduct constructed in Stage 1. Similar to 3K-HV and 3K-AMP, I-90 eastbound off-ramp traffic will be shifted to the new ramp and access will be provided to Cambridge Street via the permanent connector bridge over I-90, temporary bridge connections over existing I-90 and existing interchange ramps. I-90 eastbound traffic will access the eastbound on-ramp from the Cambridge Street area via the temporary bridge over existing I-90 connection to permanent connector bridge over I-90. I-90 westbound traffic will remain on the existing I-90 viaduct and westbound mainline and ramp alignments within the interchange. SFR traffic will be shifted to the realigned roadway.

Interchange and Streets. Construction will continue on the new I-90 highway, ramp and interchange system within the area south of the existing I-90 alignment if not completed in Stage 1. Existing I-90 eastbound in the vicinity of the Cambridge Street bridge over I-90 will be reconstructed to a lower profile to meet the new I-90 mainline horizontal and vertical alignments. Construction of temporary at-grade I-90 westbound alignment within BPY, between the existing I-90 viaduct and the newly constructed connector overpass, will also begin.

Rail. The Worcester Main Line will be on the southernmost track. Grand Junction service will remain closed. Track work will consist of Grand Junction over I-90 bridge northern abutment. Construction will include permanent mainline track alignments to carry inbound/outbound Framingham/Worcester commuter trains in subsequent stages and under the final condition, new West Station platforms and temporary track connections as needed.

Pedestrian and Bicycles. Existing pedestrian and bicycle facilities on Cambridge Street will be maintained in this stage. PDW path will temporarily realigned to the south with the new path being opened within this stage.

*BASEMAP DEPICTS CONDITIONS PRIOR TO MassDOT AET PROJECT WHICH DOES NOT IMPACT THE CONTINUITY OF CONSTRUCTION STAGING AS SHOWN

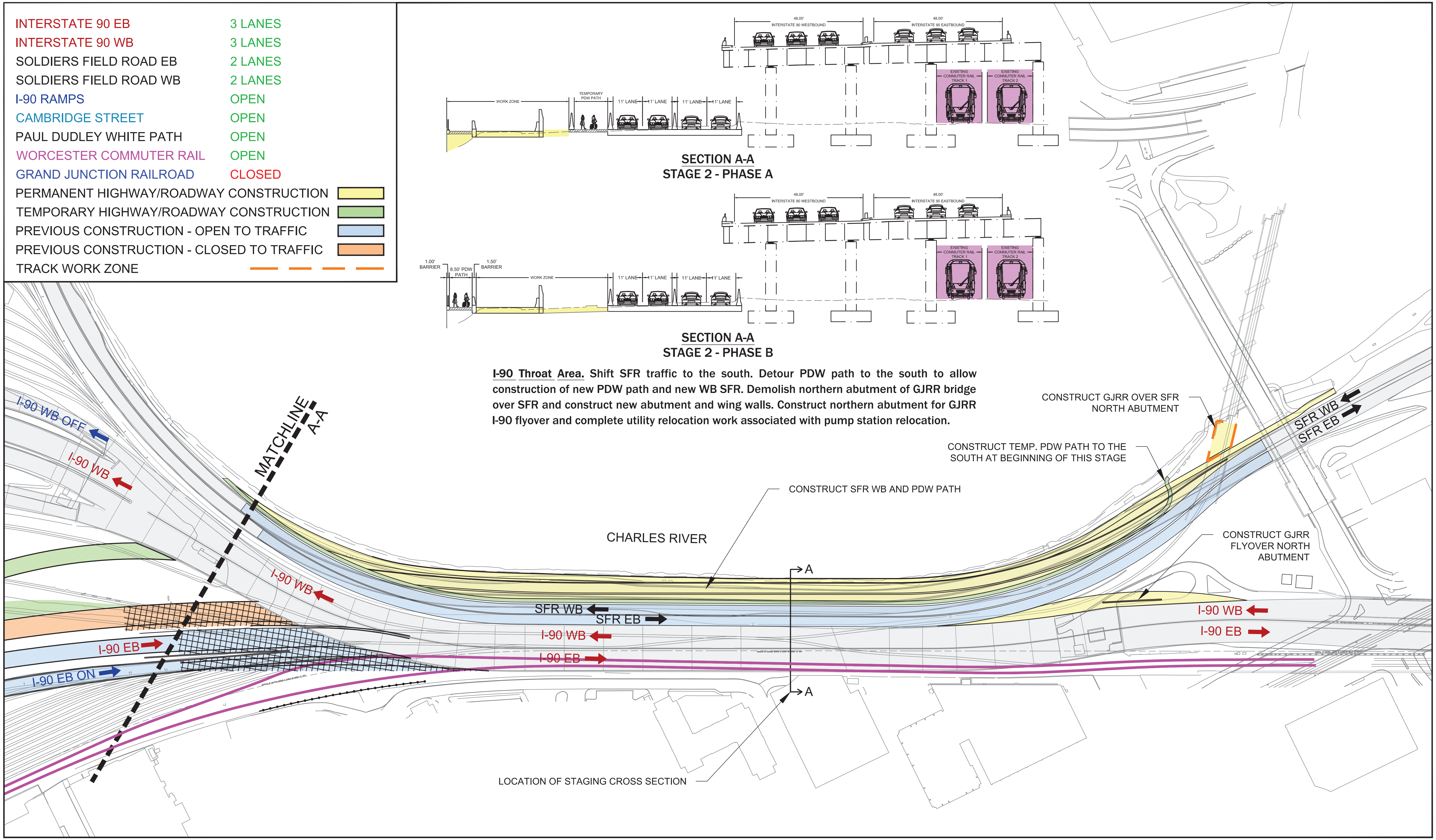
N
0
200
400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

I-90 Urban Interchange, 3K-ABC
Construction Stage 2

FIGURE
5.21-29

INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	OPEN
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	— — — —


48.00'
INTERSTATE 90 WESTBOUND
48.00'
INTERSTATE 90 EASTBOUND
EXISTING COMMUTER RAIL TRACK 1
EXISTING COMMUTER RAIL TRACK 2
WORK ZONE
TEMPORARY PDW PATH
11' LANE
11' LANE
11' LANE
11' LANE
1.00' BARRIER
8.50' PDW PATH
1.50' BARRIER
MATCHLINE A-A
I-90 WB OFF
I-90 WB
I-90 WB
I-90 EB
I-90 EB ON
CHARLES RIVER
SFR WB
SFR EB
I-90 WB
I-90 EB
A
A
SFR WB
SFR EB
I-90 WB
I-90 EB
CONSTRUCT GJRR OVER SFR NORTH ABUTMENT
CONSTRUCT TEMP. PDW PATH TO THE SOUTH AT BEGINNING OF THIS STAGE
CONSTRUCT SFR WB AND PDW PATH
CONSTRUCT GJRR FLYOVER NORTH ABUTMENT
LOCATION OF STAGING CROSS SECTION
N
0
100
200
Feet

SECTION A-A
STAGE 2 - PHASE A

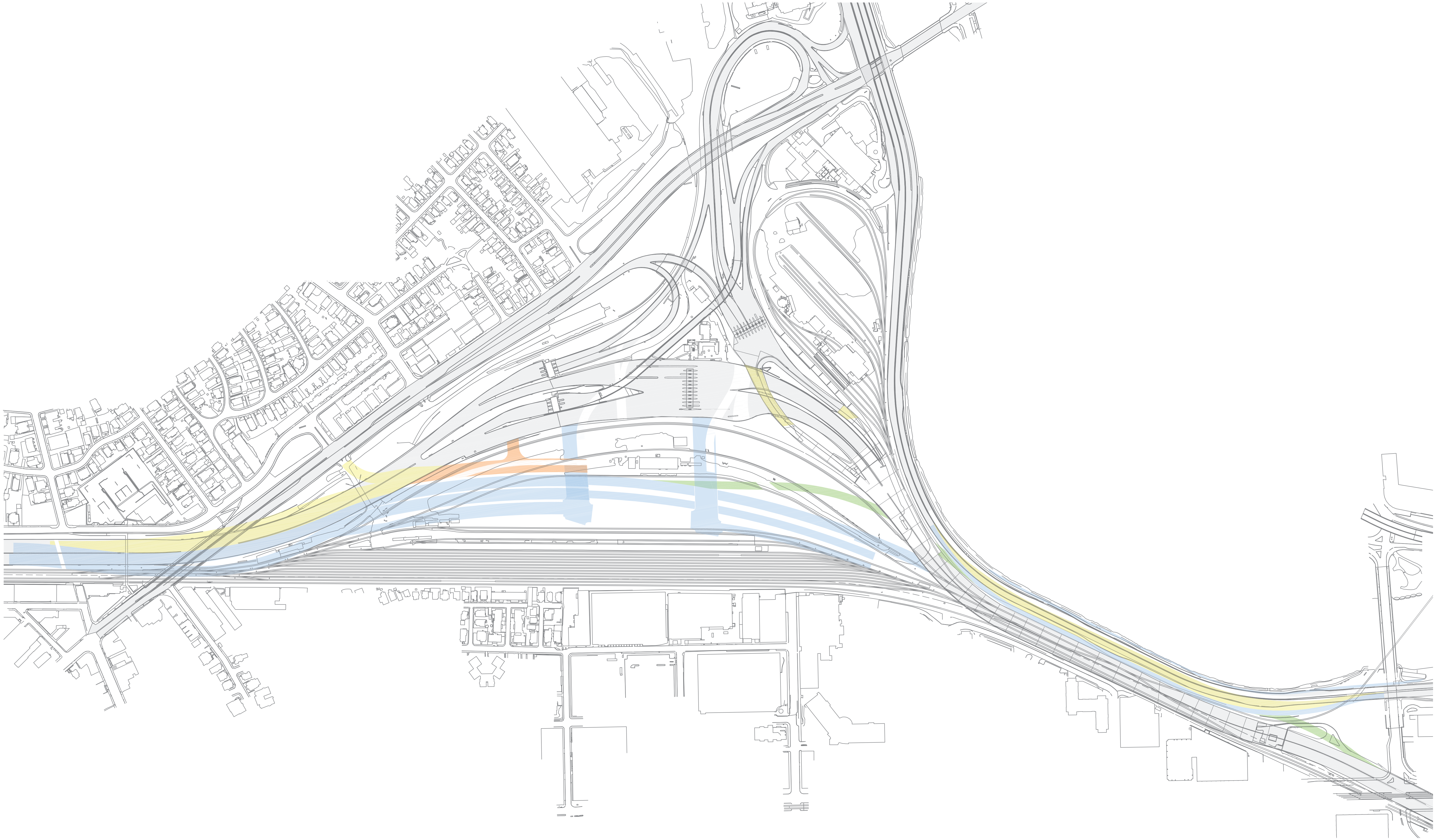
SECTION A-A
STAGE 2 - PHASE B

I-90 Throat Area. Shift SFR traffic to the south. Detour PDW path to the south to allow construction of new PDW path and new WB SFR. Demolish northern abutment of GJRR bridge over SFR and construct new abutment and wing walls. Construct northern abutment for GJRR I-90 flyover and complete utility relocation work associated with pump station relocation.

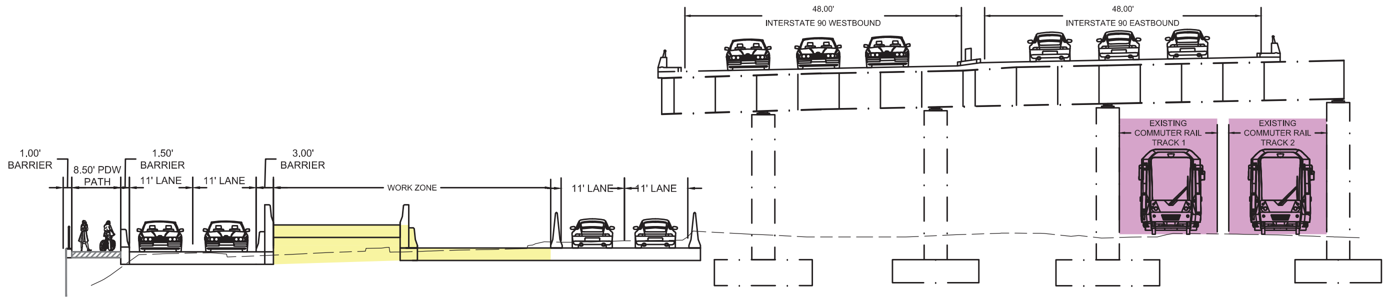
I-90 Allston Interchange Project
Draft Environmental Impact Report

I-90 Urban Interchange, 3K-ABC
Construction Stage 2

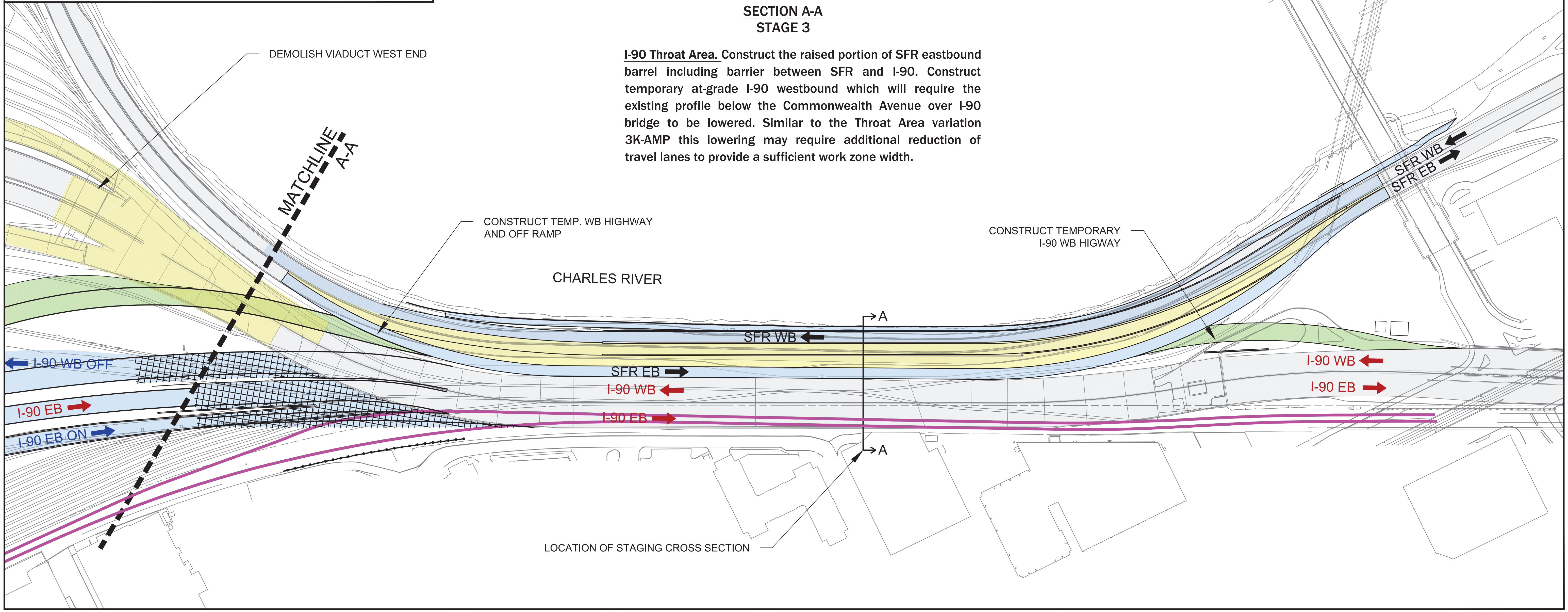
FIGURE
5.21-30



INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	OPEN
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	– – – –


48.00'
INTERSTATE 90 WESTBOUND
48.00'
INTERSTATE 90 EASTBOUND
1.00' BARRIER
8.50' PDW PATH
1.50' BARRIER
11' LANE
11' LANE
3.00' BARRIER
WORK ZONE
11' LANE
11' LANE
EXISTING COMMUTER RAIL TRACK 1
EXISTING COMMUTER RAIL TRACK 2

SECTION A-A
STAGE 3

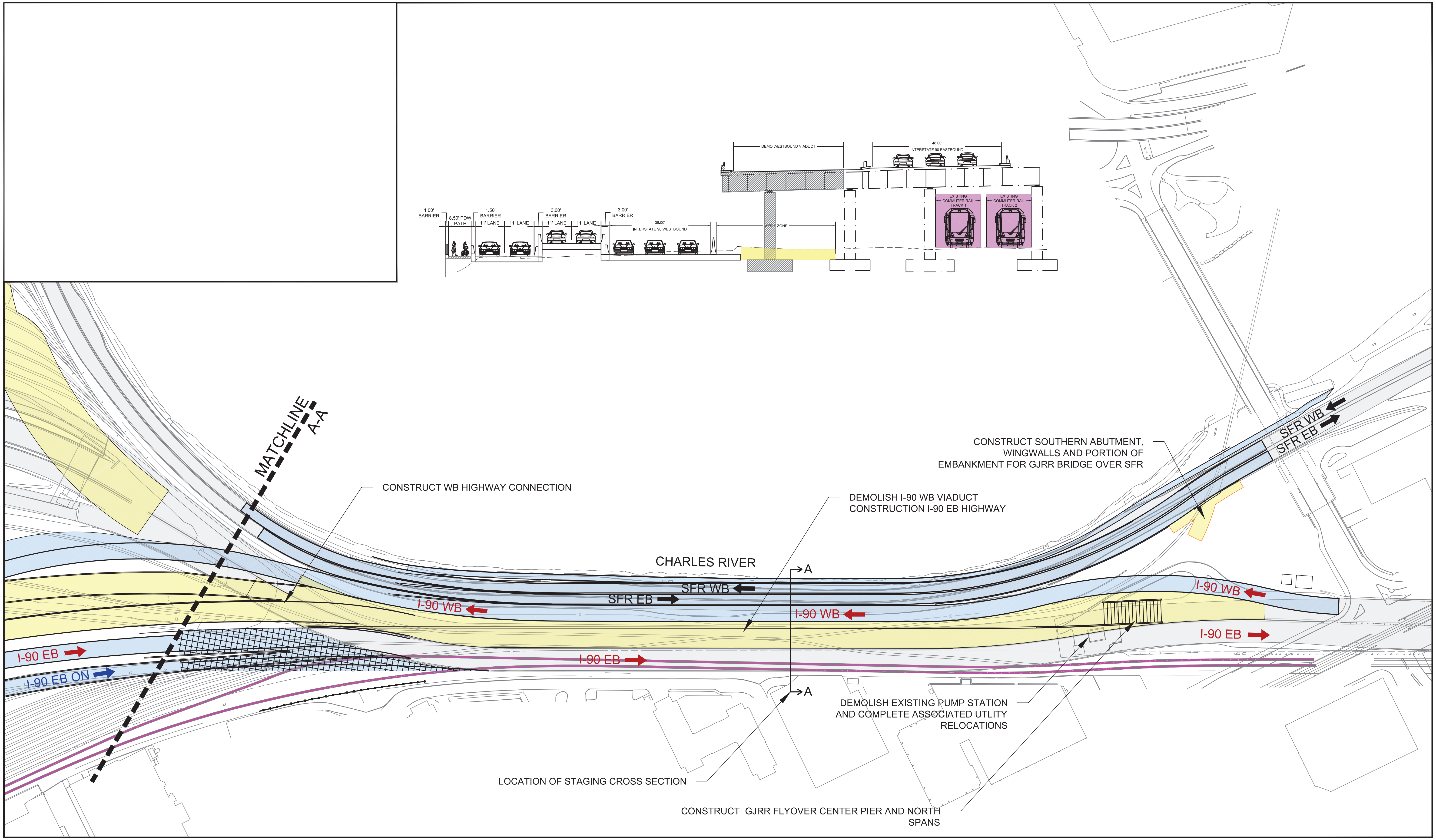

DEMOLISH VIADUCT WEST END
MATCHLINE A-A
CONSTRUCT TEMP. WB HIGHWAY AND OFF RAMP
CHARLES RIVER
CONSTRUCT TEMPORARY I-90 WB HIGWAY
SFR WB
SFR EB
A
A
SFR WB
SFR EB
I-90 WB OFF
I-90 EB
I-90 EB ON
I-90 WB
I-90 EB
I-90 WB
I-90 EB
LOCATION OF STAGING CROSS SECTION

I-90 Throat Area. Construct the raised portion of SFR eastbound barrel including barrier between SFR and I-90. Construct temporary at-grade I-90 westbound which will require the existing profile below the Commonwealth Avenue over I-90 bridge to be lowered. Similar to the Throat Area variation 3K-AMP this lowering may require additional reduction of travel lanes to provide a sufficient work zone width.

0 100 200
Feet

I-90 Urban Interchange, 3K-ABC
Construction Stage 3

FIGURE
5.21-32


DEMO WESTBOUND VIADUCT
48.00'
INTERSTATE 90 EASTBOUND
EXISTING COMMUTER RAIL TRACK 1
EXISTING COMMUTER RAIL TRACK 2
1.00' BARRIER
8.50' PDW PATH
1.50' BARRIER
11' LANE
11' LANE
3.00' BARRIER
11' LANE
11' LANE
3.00' BARRIER
38.00'
INTERSTATE 90 WESTBOUND
WORK ZONE
MATCHLINE A-A
CONSTRUCT WB HIGHWAY CONNECTION
CONSTRUCT SOUTHERN ABUTMENT, WINGWALLS AND PORTION OF EMBANKMENT FOR GJRR BRIDGE OVER SFR
SFR WB
SFR EB
DEMOLISH I-90 WB VIADUCT CONSTRUCTION I-90 EB HIGHWAY
CHARLES RIVER
A
SFR WB
SFR EB
I-90 WB
I-90 WB
I-90 WB
I-90 EB
I-90 EB
I-90 EB
I-90 EB ON
A
DEMOLISH EXISTING PUMP STATION AND COMPLETE ASSOCIATED UTLITY RELOCATIONS
LOCATION OF STAGING CROSS SECTION
CONSTRUCT GJRR FLYOVER CENTER PIER AND NORTH SPANS

N

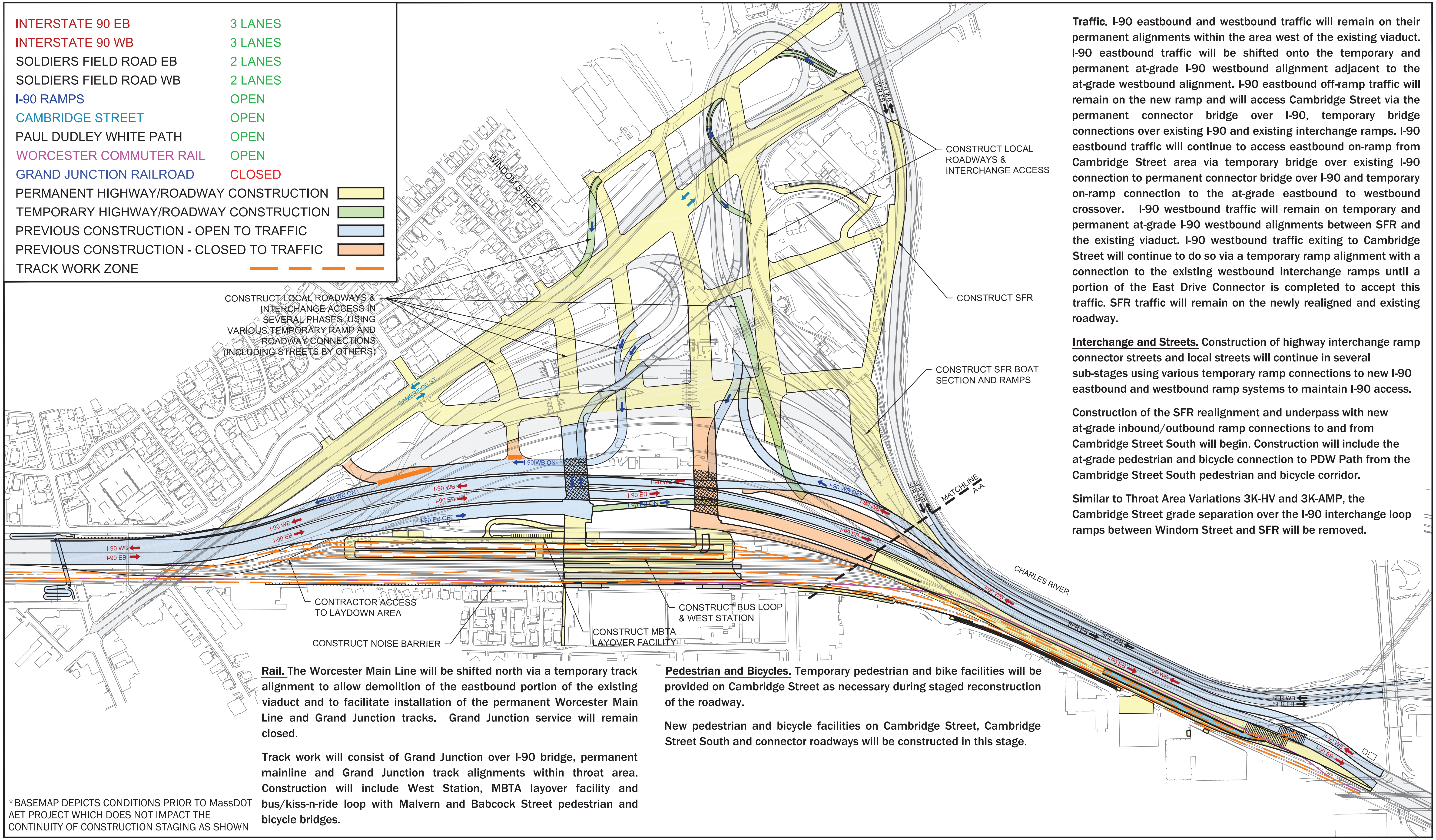
0 100 200
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

I-90 Urban Interchange, 3K-ABC Construction Stag

FIGURE
5.21-34

INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	OPEN
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	— — — —


CONSTRUCT LOCAL ROADWAYS & INTERCHANGE ACCESS IN SEVERAL PHASES, USING VARIOUS TEMPORARY RAMP AND ROADWAY CONNECTIONS (INCLUDING STREETS BY OTHERS)
WINDOM STREET
CAMBRIDGE ST
CONSTRUCT LOCAL ROADWAYS & INTERCHANGE ACCESS
CONSTRUCT SFR
CONSTRUCT SFR BOAT SECTION AND RAMPS
SFR WB
SFR EB
I-90 WB ON
I-90 WB
I-90 EB
I-90 EB OFF
I-90 EB ON
I-90 WB OFF
MATCHLINE A-A
CHARLES RIVER
CONTRACTOR ACCESS TO LAYDOWN AREA
CONSTRUCT NOISE BARRIER
CONSTRUCT MBTA LAYOVER FACILITY
CONSTRUCT BUS LOOP & WEST STATION

Traffic. I-90 eastbound and westbound traffic will remain on their permanent alignments within the area west of the existing viaduct. I-90 eastbound traffic will be shifted onto the temporary and permanent at-grade I-90 westbound alignment adjacent to the at-grade westbound alignment. I-90 eastbound off-ramp traffic will remain on the new ramp and will access Cambridge Street via the permanent connector bridge over I-90, temporary bridge connections over existing I-90 and existing interchange ramps. I-90 eastbound traffic will continue to access eastbound on-ramp from Cambridge Street area via temporary bridge over existing I-90 connection to permanent connector bridge over I-90 and temporary on-ramp connection to the at-grade eastbound to westbound crossover. I-90 westbound traffic will remain on temporary and permanent at-grade I-90 westbound alignments between SFR and the existing viaduct. I-90 westbound traffic exiting to Cambridge Street will continue to do so via a temporary ramp alignment with a connection to the existing westbound interchange ramps until a portion of the East Drive Connector is completed to accept this traffic. SFR traffic will remain on the newly realigned and existing roadway.

Interchange and Streets. Construction of highway interchange ramp connector streets and local streets will continue in several sub-stages using various temporary ramp connections to new I-90 eastbound and westbound ramp systems to maintain I-90 access.

Construction of the SFR realignment and underpass with new at-grade inbound/outbound ramp connections to and from Cambridge Street South will begin. Construction will include the at-grade pedestrian and bicycle connection to PDW Path from the Cambridge Street South pedestrian and bicycle corridor.

Similar to Throat Area Variations 3K-HV and 3K-AMP, the Cambridge Street grade separation over the I-90 interchange loop ramps between Windom Street and SFR will be removed.

Rail. The Worcester Main Line will be shifted north via a temporary track alignment to allow demolition of the eastbound portion of the existing viaduct and to facilitate installation of the permanent Worcester Main Line and Grand Junction tracks. Grand Junction service will remain closed.

Track work will consist of Grand Junction over I-90 bridge, permanent mainline and Grand Junction track alignments within throat area. Construction will include West Station, MBTA layover facility and bus/kiss-n-ride loop with Malvern and Babcock Street pedestrian and bicycle bridges.

Pedestrian and Bicycles. Temporary pedestrian and bike facilities will be provided on Cambridge Street as necessary during staged reconstruction of the roadway.

New pedestrian and bicycle facilities on Cambridge Street, Cambridge Street South and connector roadways will be constructed in this stage.

*BASEMAP DEPICTS CONDITIONS PRIOR TO MassDOT AET PROJECT WHICH DOES NOT IMPACT THE CONTINUITY OF CONSTRUCTION STAGING AS SHOWN

INTERSTATE 90
ALLSTON
INTERCHANGE

massDOT
Massachusetts Department of Transportation
Highway Division

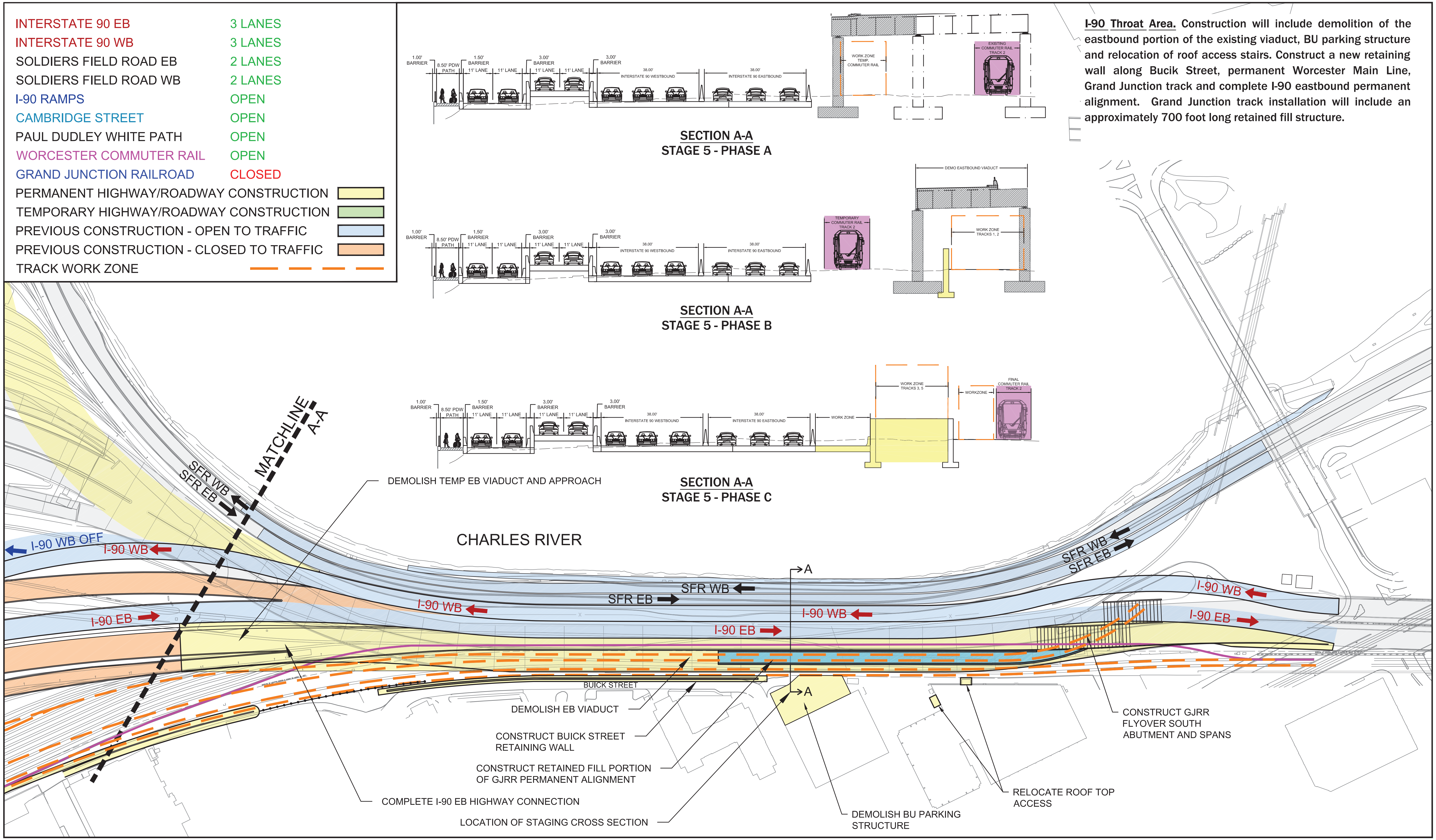
N

0 200 400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

I-90 Urban Interchange, 3K-ABC
Construction Stage 5

FIGURE
5.21-35



INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	OPEN
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	— — —

I-90 Throat Area. Construction will include demolition of the eastbound portion of the existing viaduct, BU parking structure and relocation of roof access stairs. Construct a new retaining wall along Bucik Street, permanent Worcester Main Line, Grand Junction track and complete I-90 eastbound permanent alignment. Grand Junction track installation will include an approximately 700 foot long retained fill structure.

1.00' BARRIER
8.50' PDW PATH
1.50' BARRIER
11' LANE
11' LANE
3.00' BARRIER
11' LANE
11' LANE
3.00' BARRIER
38.00' INTERSTATE 90 WESTBOUND
38.00' INTERSTATE 90 EASTBOUND
WORK ZONE TEMP. COMMUTER RAIL
EXISTING COMMUTER RAIL TRACK 2
SECTION A-A
STAGE 5 - PHASE A
DEMO EASTBOUND VIADUCT
TEMPORARY COMMUTER RAIL TRACK 2
WORK ZONE TRACKS 1, 2
SECTION A-A
STAGE 5 - PHASE B
WORK ZONE
WORK ZONE TRACKS 3, 5
WORKZONE
FINAL COMMUTER RAIL TRACK 2
SECTION A-A
STAGE 5 - PHASE C
MATCHLINE A-A
SFR WB
SFR EB
DEMOLISH TEMP EB VIADUCT AND APPROACH
CHARLES RIVER
I-90 WB OFF
I-90 WB
I-90 EB
I-90 WB
SFR EB
SFR WB
A
I-90 WB
I-90 EB
SFR WB
SFR EB
I-90 WB
I-90 EB
BUICK STREET
A
DEMOLISH EB VIADUCT
CONSTRUCT BUICK STREET RETAINING WALL
CONSTRUCT RETAINED FILL PORTION OF GJRR PERMANENT ALIGNMENT
COMPLETE I-90 EB HIGHWAY CONNECTION
LOCATION OF STAGING CROSS SECTION
DEMOLISH BU PARKING STRUCTURE
RELOCATE ROOF TOP ACCESS
CONSTRUCT GJRR FLYOVER SOUTH ABUTMENT AND SPANS

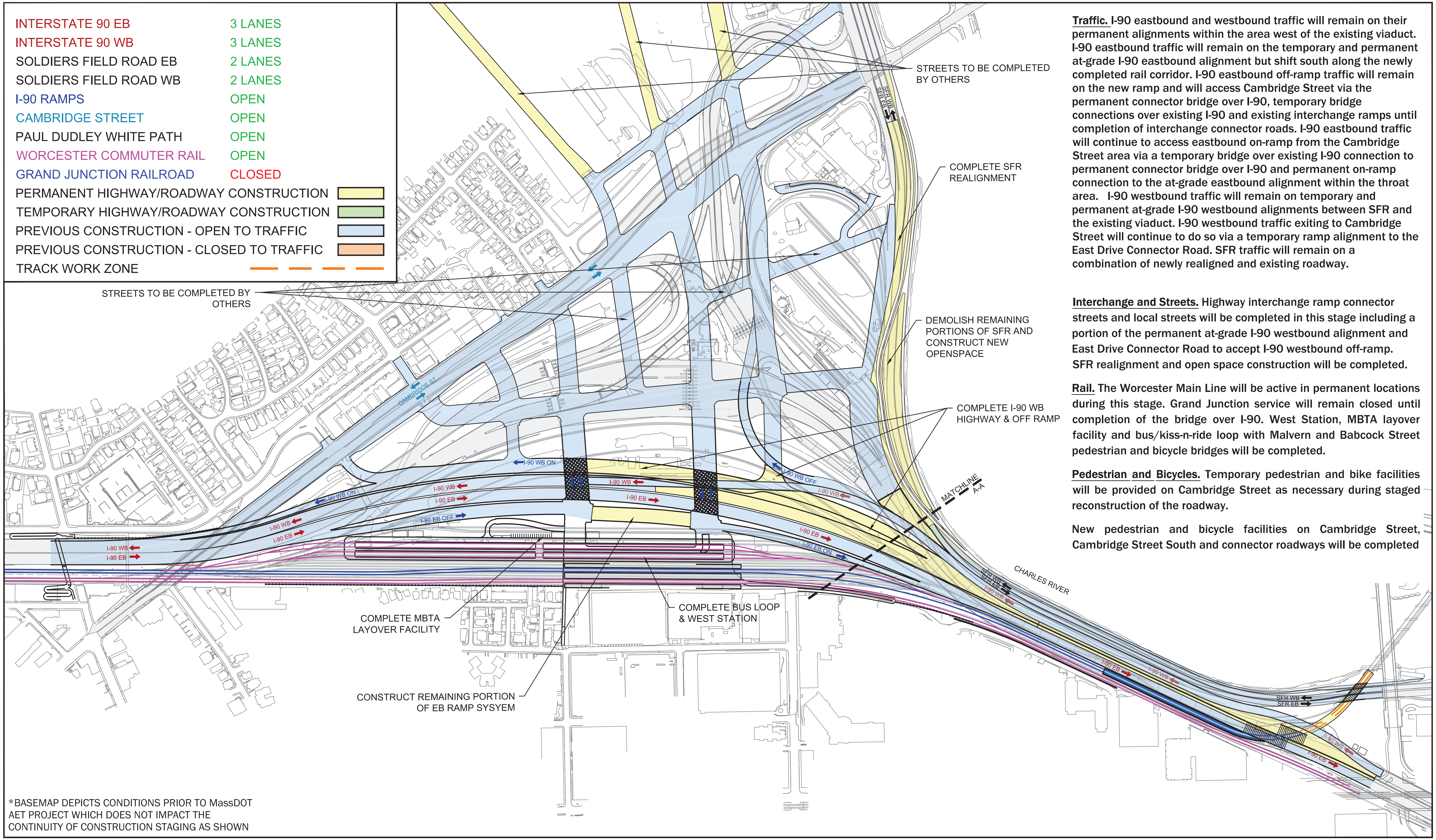
N
0 100 200
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

I-90 Urban Interchange, 3K-ABC
Construction Stage 5

FIGURE
5.21-36

INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	OPEN
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	— — — —



STREETS TO BE COMPLETED BY OTHERS

STREETS TO BE COMPLETED BY OTHERS

COMPLETE SFR REALIGNMENT

DEMOLISH REMAINING PORTIONS OF SFR AND CONSTRUCT NEW OPENSPACE

COMPLETE I-90 WB HIGHWAY & OFF RAMP

COMPLETE BUS LOOP & WEST STATION

COMPLETE MBTA LAYOVER FACILITY

CONSTRUCT REMAINING PORTION OF EB RAMP SYSYEM

*BASEMAP DEPICTS CONDITIONS PRIOR TO MassDOT AET PROJECT WHICH DOES NOT IMPACT THE CONTINUITY OF CONSTRUCTION STAGING AS SHOWN

Traffic. I-90 eastbound and westbound traffic will remain on their permanent alignments within the area west of the existing viaduct. I-90 eastbound traffic will remain on the temporary and permanent at-grade I-90 eastbound alignment but shift south along the newly completed rail corridor. I-90 eastbound off-ramp traffic will remain on the new ramp and will access Cambridge Street via the permanent connector bridge over I-90, temporary bridge connections over existing I-90 and existing interchange ramps until completion of interchange connector roads. I-90 eastbound traffic will continue to access eastbound on-ramp from the Cambridge Street area via a temporary bridge over existing I-90 connection to permanent connector bridge over I-90 and permanent on-ramp connection to the at-grade eastbound alignment within the throat area. I-90 westbound traffic will remain on temporary and permanent at-grade I-90 westbound alignments between SFR and the existing viaduct. I-90 westbound traffic exiting to Cambridge Street will continue to do so via a temporary ramp alignment to the East Drive Connector Road. SFR traffic will remain on a combination of newly realigned and existing roadway.

Interchange and Streets. Highway interchange ramp connector streets and local streets will be completed in this stage including a portion of the permanent at-grade I-90 westbound alignment and East Drive Connector Road to accept I-90 westbound off-ramp. SFR realignment and open space construction will be completed.

Rail. The Worcester Main Line will be active in permanent locations during this stage. Grand Junction service will remain closed until completion of the bridge over I-90. West Station, MBTA layover facility and bus/kiss-n-ride loop with Malvern and Babcock Street pedestrian and bicycle bridges will be completed.

Pedestrian and Bicycles. Temporary pedestrian and bike facilities will be provided on Cambridge Street as necessary during staged reconstruction of the roadway.

New pedestrian and bicycle facilities on Cambridge Street, Cambridge Street South and connector roadways will be completed

N

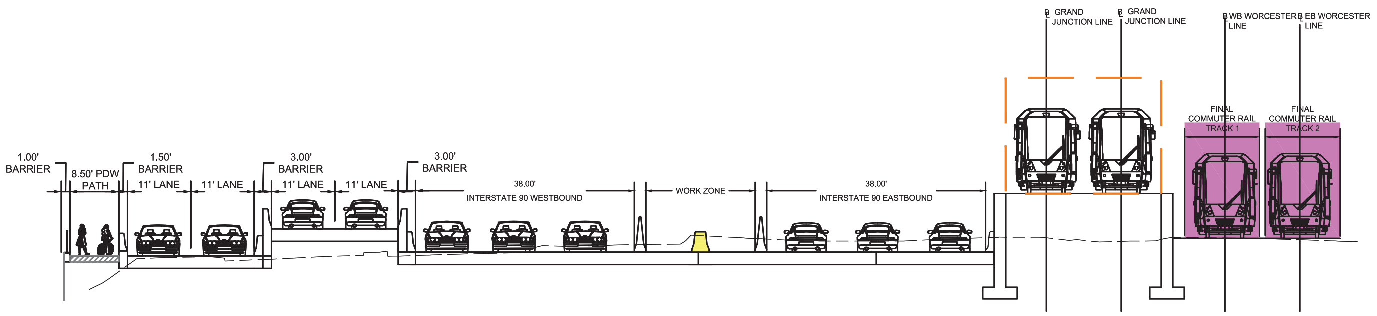
0 200 400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

I-90 Urban Interchange, 3K-ABC
Construction Stage 6

FIGURE
5.21-37

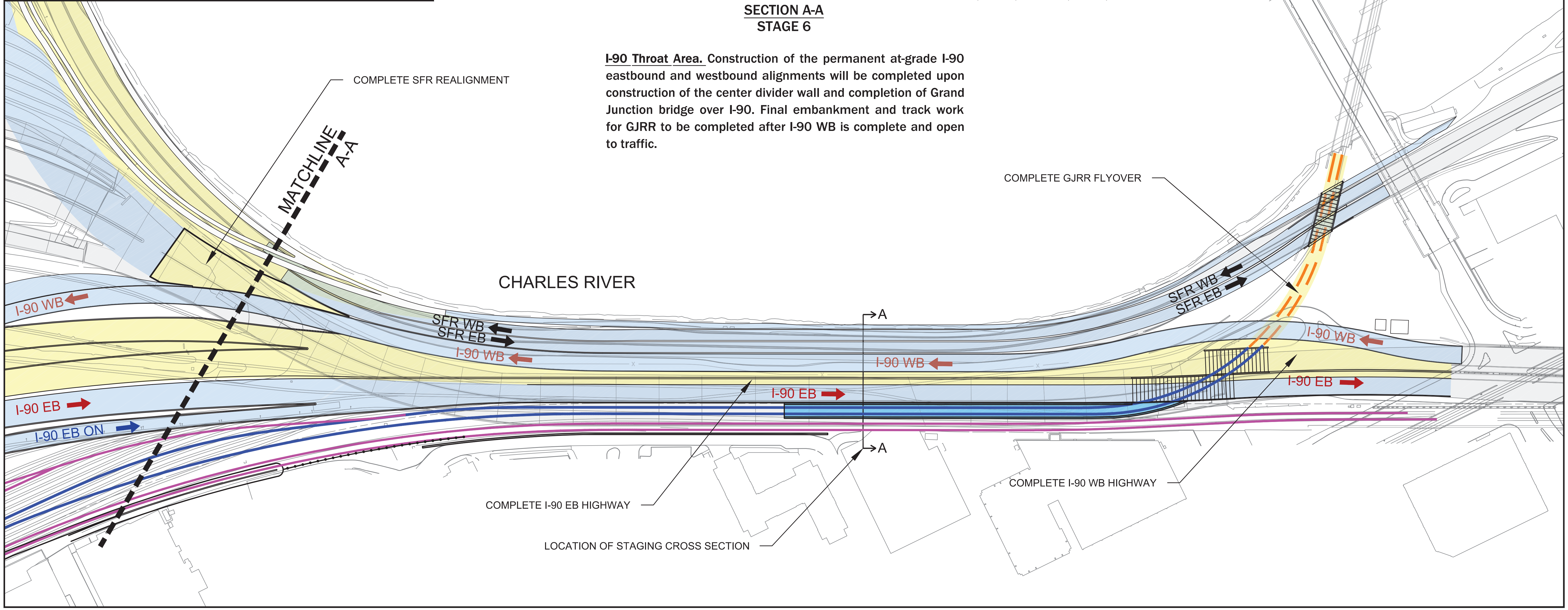
INTERSTATE 90 EB	3 LANES
INTERSTATE 90 WB	3 LANES
SOLDIERS FIELD ROAD EB	2 LANES
SOLDIERS FIELD ROAD WB	2 LANES
I-90 RAMPS	OPEN
CAMBRIDGE STREET	OPEN
PAUL DUDLEY WHITE PATH	OPEN
WORCESTER COMMUTER RAIL	OPEN
GRAND JUNCTION RAILROAD	CLOSED
PERMANENT HIGHWAY/ROADWAY CONSTRUCTION	🟨
TEMPORARY HIGHWAY/ROADWAY CONSTRUCTION	🟩
PREVIOUS CONSTRUCTION - OPEN TO TRAFFIC	🟦
PREVIOUS CONSTRUCTION - CLOSED TO TRAFFIC	🟧
TRACK WORK ZONE	– – – –



1.00' BARRIER
8.50' PDW PATH
1.50' BARRIER
11' LANE
11' LANE
3.00' BARRIER
11' LANE
11' LANE
3.00' BARRIER
38.00' INTERSTATE 90 WESTBOUND
WORK ZONE
38.00' INTERSTATE 90 EASTBOUND
℄ GRAND JUNCTION LINE
℄ GRAND JUNCTION LINE
℄ WB WORCESTER LINE
℄ EB WORCESTER LINE
FINAL COMMUTER RAIL TRACK 1
FINAL COMMUTER RAIL TRACK 2

SECTION A-A
STAGE 6

I-90 Throat Area. Construction of the permanent at-grade I-90 eastbound and westbound alignments will be completed upon construction of the center divider wall and completion of Grand Junction bridge over I-90. Final embankment and track work for GJRR to be completed after I-90 WB is complete and open to traffic.



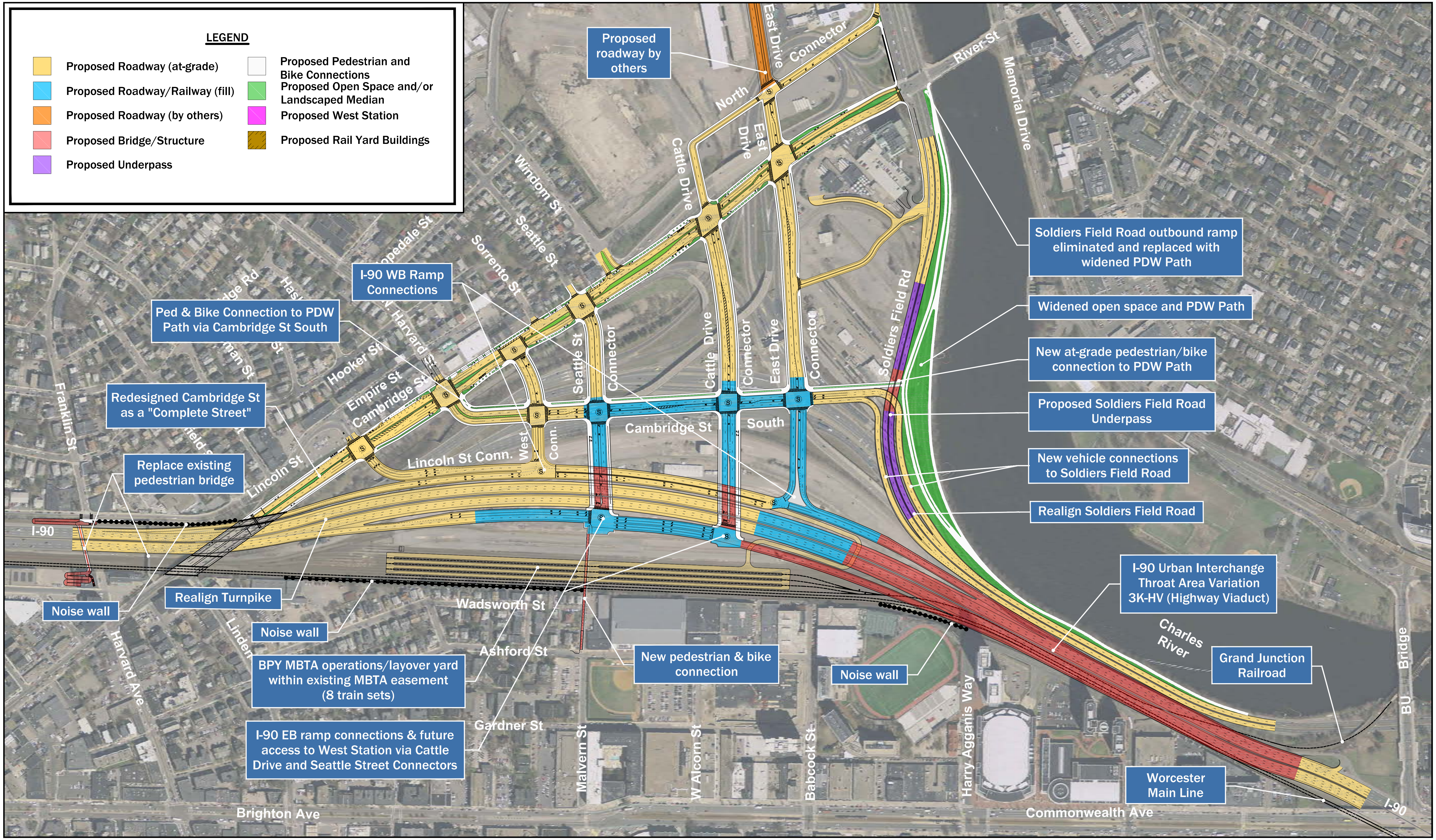
COMPLETE SFR REALIGNMENT
MATCHLINE A-A
CHARLES RIVER
COMPLETE GJRR FLYOVER
I-90 WB
SFR WB
SFR EB
I-90 WB
I-90 WB
SFR WB
SFR EB
I-90 WB
I-90 EB
I-90 EB ON
I-90 EB
I-90 EB
A
A
COMPLETE I-90 WB HIGHWAY
COMPLETE I-90 EB HIGHWAY
LOCATION OF STAGING CROSS SECTION

N
0
100
200
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

I-90 Urban Interchange, 3K-ABC
Construction Stage 6

FIGURE
5.21-38

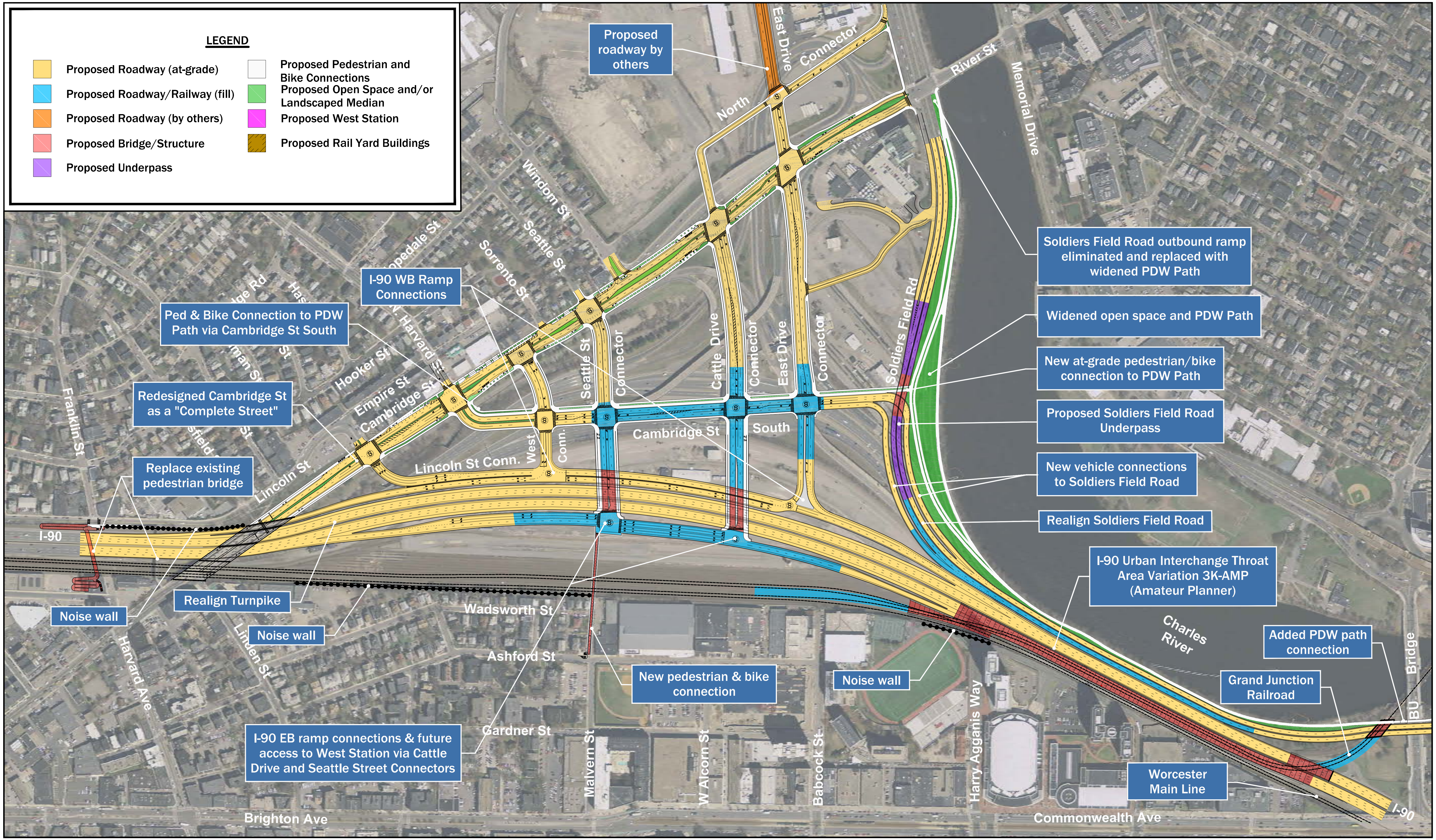

LEGEND
🟨 Proposed Roadway (at-grade)
🟦 Proposed Roadway/Railway (fill)
🟧 Proposed Roadway (by others)
🟥 Proposed Bridge/Structure
🟪 Proposed Underpass
⬜ Proposed Pedestrian and Bike Connections
🟩 Proposed Open Space and/or Landscaped Median
🟪 Proposed West Station
▨ Proposed Rail Yard Buildings
Proposed roadway by others
I-90 WB Ramp Connections
Ped & Bike Connection to PDW Path via Cambridge St South
Redesigned Cambridge St as a "Complete Street"
Replace existing pedestrian bridge
Noise wall
Realign Turnpike
Noise wall
BPY MBTA operations/layover yard within existing MBTA easement (8 train sets)
I-90 EB ramp connections & future access to West Station via Cattle Drive and Seattle Street Connectors
New pedestrian & bike connection
Noise wall
Soldiers Field Road outbound ramp eliminated and replaced with widened PDW Path
Widened open space and PDW Path
New at-grade pedestrian/bike connection to PDW Path
Proposed Soldiers Field Road Underpass
New vehicle connections to Soldiers Field Road
Realign Soldiers Field Road
I-90 Urban Interchange Throat Area Variation 3K-HV (Highway Viaduct)
Grand Junction Railroad
Worcester Main Line
I-90
I-90
East Drive
Connector
North
East Drive
Cattle Drive
River St
Memorial Drive
Windom St
Seattle St
Sorrento St
Hopedale St
Hooker St
Empire St
Cambridge St
Franklin St
Lincoln St
Lincoln St Conn.
West Conn.
Seattle St Connector
Cattle Drive Connector
East Drive Connector
Cambridge St South
Soldiers Field Rd
Charles River
Wadsworth St
Ashford St
Linden St
Harvard Ave
Gardner St
Malvern St
W Alcorn St
Babcock St
Harry Agganis Way
Brighton Ave
Commonwealth Ave
BU Bridge

N
0 200 400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE
5.22-1

Phase 1
I-90 Urban Interchange, 3K-HV

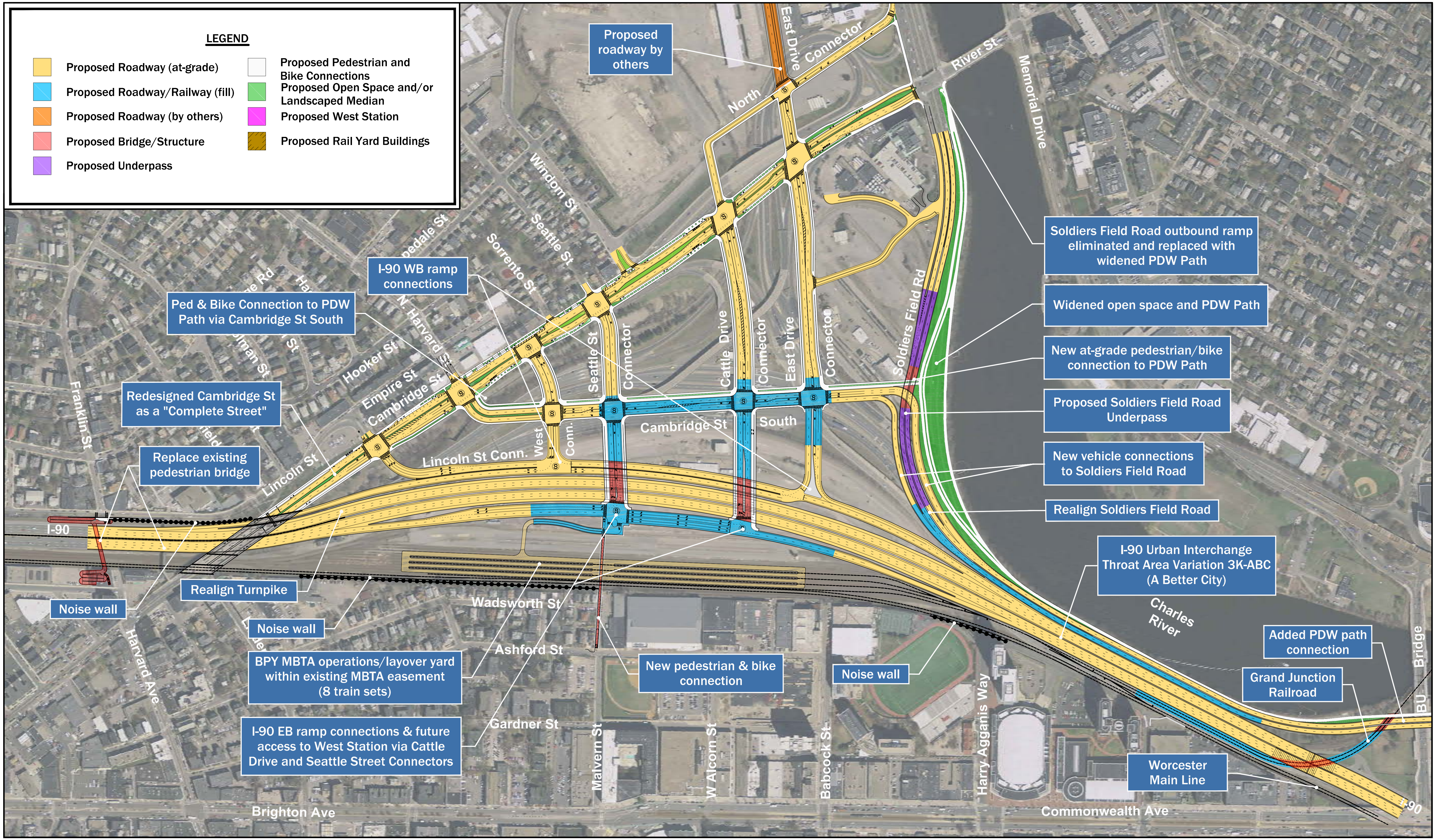

LEGEND
🟨 Proposed Roadway (at-grade)
🟦 Proposed Roadway/Railway (fill)
🟧 Proposed Roadway (by others)
🟥 Proposed Bridge/Structure
🟪 Proposed Underpass
⬜ Proposed Pedestrian and Bike Connections
🟩 Proposed Open Space and/or Landscaped Median
🟪 Proposed West Station
▨ Proposed Rail Yard Buildings
Proposed roadway by others
I-90 WB Ramp Connections
Ped & Bike Connection to PDW Path via Cambridge St South
Redesigned Cambridge St as a "Complete Street"
Replace existing pedestrian bridge
Noise wall
Realign Turnpike
Noise wall
New pedestrian & bike connection
Noise wall
I-90 EB ramp connections & future access to West Station via Cattle Drive and Seattle Street Connectors
Soldiers Field Road outbound ramp eliminated and replaced with widened PDW Path
Widened open space and PDW Path
New at-grade pedestrian/bike connection to PDW Path
Proposed Soldiers Field Road Underpass
New vehicle connections to Soldiers Field Road
Realign Soldiers Field Road
I-90 Urban Interchange Throat Area Variation 3K-AMP (Amateur Planner)
Added PDW path connection
Grand Junction Railroad
Worcester Main Line
East Drive
Connector
North
River St
Memorial Drive
Windom St
Seattle St
Sorrento St
Hopedale St
Hooker St
Empire St
Cambridge St
N. Harvard St
Franklin St
Lincoln St
Lincoln St Conn.
West
Conn.
Seattle St
Connector
Cattle Drive
Connector
East Drive
Connector
Soldiers Field Rd
Cambridge St
South
I-90
Wadsworth St
Ashford St
Linden St
Harvard Ave
Gardner St
Malvern St
W Alcorn St
Babcock St
Harry Agganis Way
Brighton Ave
Commonwealth Ave
Charles River
BU Bridge
I-90

N
0 200 400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE
5.22-2

Phase 1
I-90 Urban Interchange, 3K-AMP

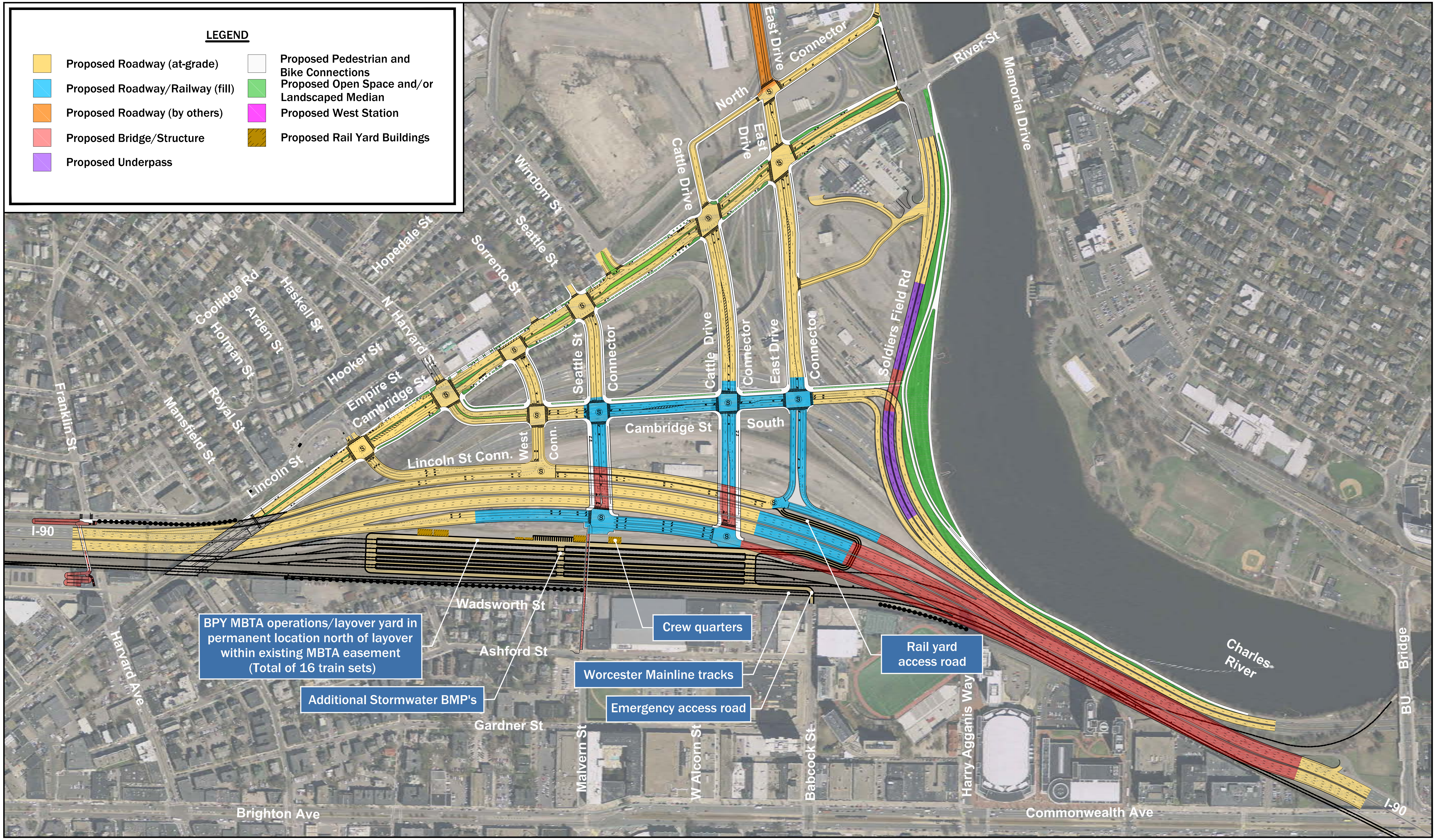

LEGEND
🟨 Proposed Roadway (at-grade)
🟦 Proposed Roadway/Railway (fill)
🟧 Proposed Roadway (by others)
🟥 Proposed Bridge/Structure
🟪 Proposed Underpass
⬜ Proposed Pedestrian and Bike Connections
🟩 Proposed Open Space and/or Landscaped Median
🟪 Proposed West Station
▨ Proposed Rail Yard Buildings
Proposed roadway by others
East Drive
Connector
North
River St
Memorial Drive
Soldiers Field Road outbound ramp eliminated and replaced with widened PDW Path
Widened open space and PDW Path
New at-grade pedestrian/bike connection to PDW Path
Proposed Soldiers Field Road Underpass
New vehicle connections to Soldiers Field Road
Realign Soldiers Field Road
I-90 Urban Interchange Throat Area Variation 3K-ABC (A Better City)
Charles River
Added PDW path connection
Grand Junction Railroad
Bridge
BU
Worcester Main Line
I-90
Commonwealth Ave
Windom St
Seattle St
Sorrento St
I-90 WB ramp connections
Ped & Bike Connection to PDW Path via Cambridge St South
N. Harvard St
Hooker St
Empire St
Cambridge St
Redesigned Cambridge St as a "Complete Street"
Replace existing pedestrian bridge
Lincoln St
Franklin St
Seattle St
Connector
Cattle Drive
Connector
East Drive
Connector
Soldiers Field Rd
Cambridge St
South
Lincoln St Conn.
West
Conn.
I-90
Realign Turnpike
Noise wall
Noise wall
Wadsworth St
Ashford St
BPY MBTA operations/layover yard within existing MBTA easement (8 train sets)
New pedestrian & bike connection
Noise wall
I-90 EB ramp connections & future access to West Station via Cattle Drive and Seattle Street Connectors
Gardner St
Malvern St
W Alcorn St
Babcock St
Harry Agganis Way
Harvard Ave
Brighton Ave

0 200 400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE
5.22-3

Phase 1
I-90 Urban Interchange, 3K-ABC


East Drive
Connector
River St
Memorial Drive
North
East Drive
Cattle Drive
Windom St
Seattle St
Hopedale St
Sorrento St
Coolidge Rd
Haskell St
Arden St
Holman St
N. Harvard St
Hooker St
Empire St
Cambridge St
Royal St
Mansfield St
Franklin St
Lincoln St
Seattle St
Connector
Cattle Drive
Connector
East Drive
Connector
Soldiers Field Rd
Cambridge St
South
Lincoln St Conn.
West
Conn.
I-90
Wadsworth St
Ashford St
Gardner St
Harvard Ave
Malvern St
W Alcorn St
Babcock St
Harry Agganis Way
Charles River
BU Bridge
Brighton Ave
Commonwealth Ave
I-90

LEGEND

- 🟨 Proposed Roadway (at-grade)
- 🟦 Proposed Roadway/Railway (fill)
- 🟧 Proposed Roadway (by others)
- 🟥 Proposed Bridge/Structure
- 🟪 Proposed Underpass
- ☐ Proposed Pedestrian and Bike Connections
- 🟩 Proposed Open Space and/or Landscaped Median
- 🟪 Proposed West Station
- ▨ Proposed Rail Yard Buildings

BPY MBTA operations/layover yard in permanent location north of layover within existing MBTA easement (Total of 16 train sets)

Crew quarters

Rail yard access road

Worcester Mainline tracks

Additional Stormwater BMP's

Emergency access road

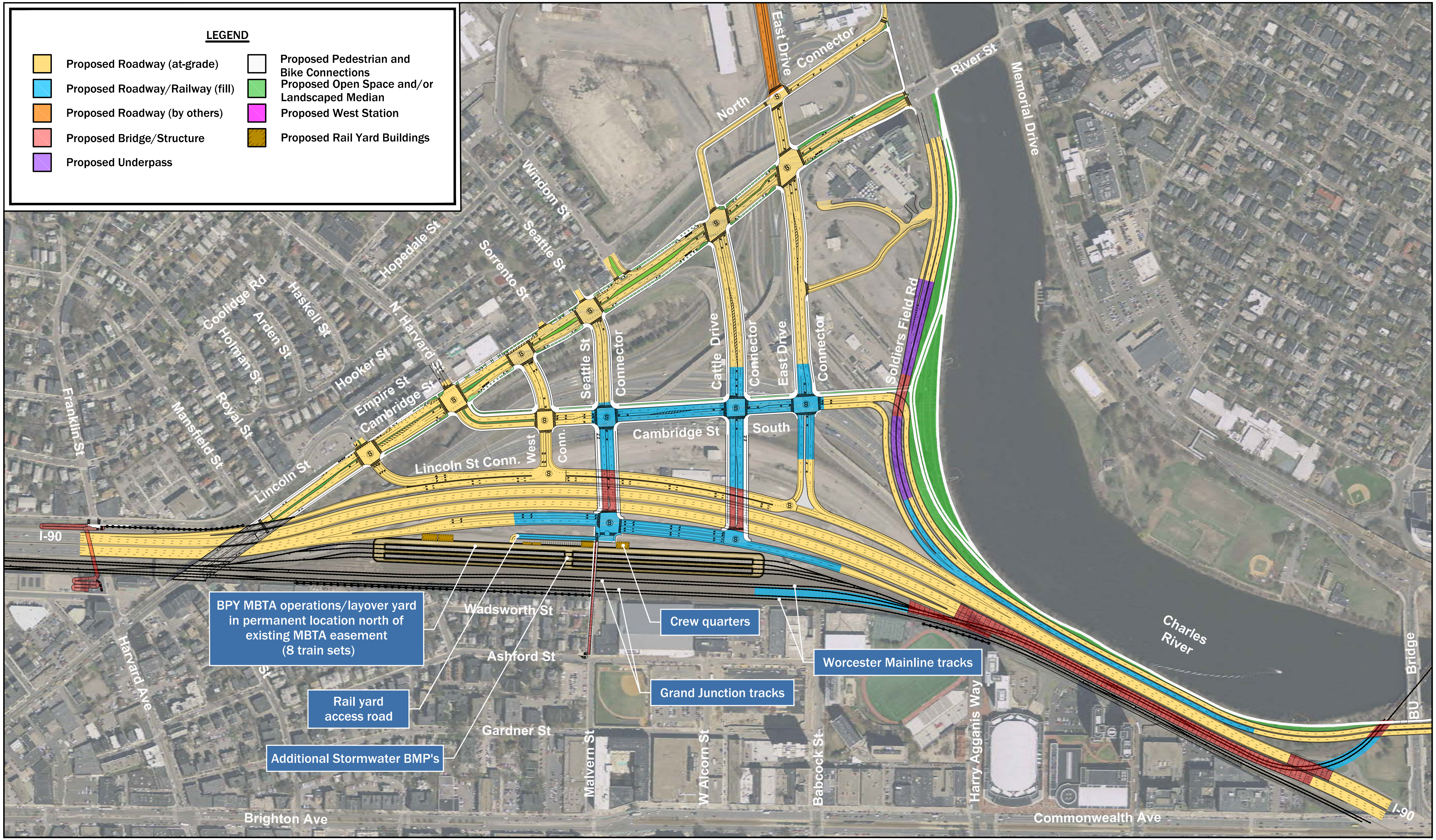
N

0 200 400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE
5.22-4

Phase 2
I-90 Urban Interchange, 3K-HV


LEGEND
🟨 Proposed Roadway (at-grade)
🟦 Proposed Roadway/Railway (fill)
🟧 Proposed Roadway (by others)
🟥 Proposed Bridge/Structure
🟪 Proposed Underpass
☐ Proposed Pedestrian and Bike Connections
🟩 Proposed Open Space and/or Landscaped Median
🟪 Proposed West Station
▨ Proposed Rail Yard Buildings
East Drive
Connector
North
River St
Memorial Drive
Windom St
Seattle St
Hopedale St
Sorrento St
Coolidge Rd
Haskell St
Arden St
N. Harvard St
Holman St
Hooker St
Empire St
Cambridge St
Franklin St
Royal St
Mansfield St
Seattle St
Connector
Cattle Drive
Connector
East Drive
Connector
Soldiers Field Rd
Cambridge St
South
West
Conn.
Lincoln St Conn.
Lincoln St
I-90
BPY MBTA operations/layover yard in permanent location north of existing MBTA easement (8 train sets)
Wadsworth St
Crew quarters
Ashford St
St
Harvard Ave
Worcester Mainline tracks
Charles River
Bridge
BU
Grand Junction tracks
Rail yard access road
Gardner St
Additional Stormwater BMP's
Malvern St
W Alcorn St
Babcock St
Harry Agganis Way
Brighton Ave
Commonwealth Ave
I-90

INTERSTATE 90 ALLSTON INTERCHANGE

massDOT Massachusetts Department of Transportation Highway Division

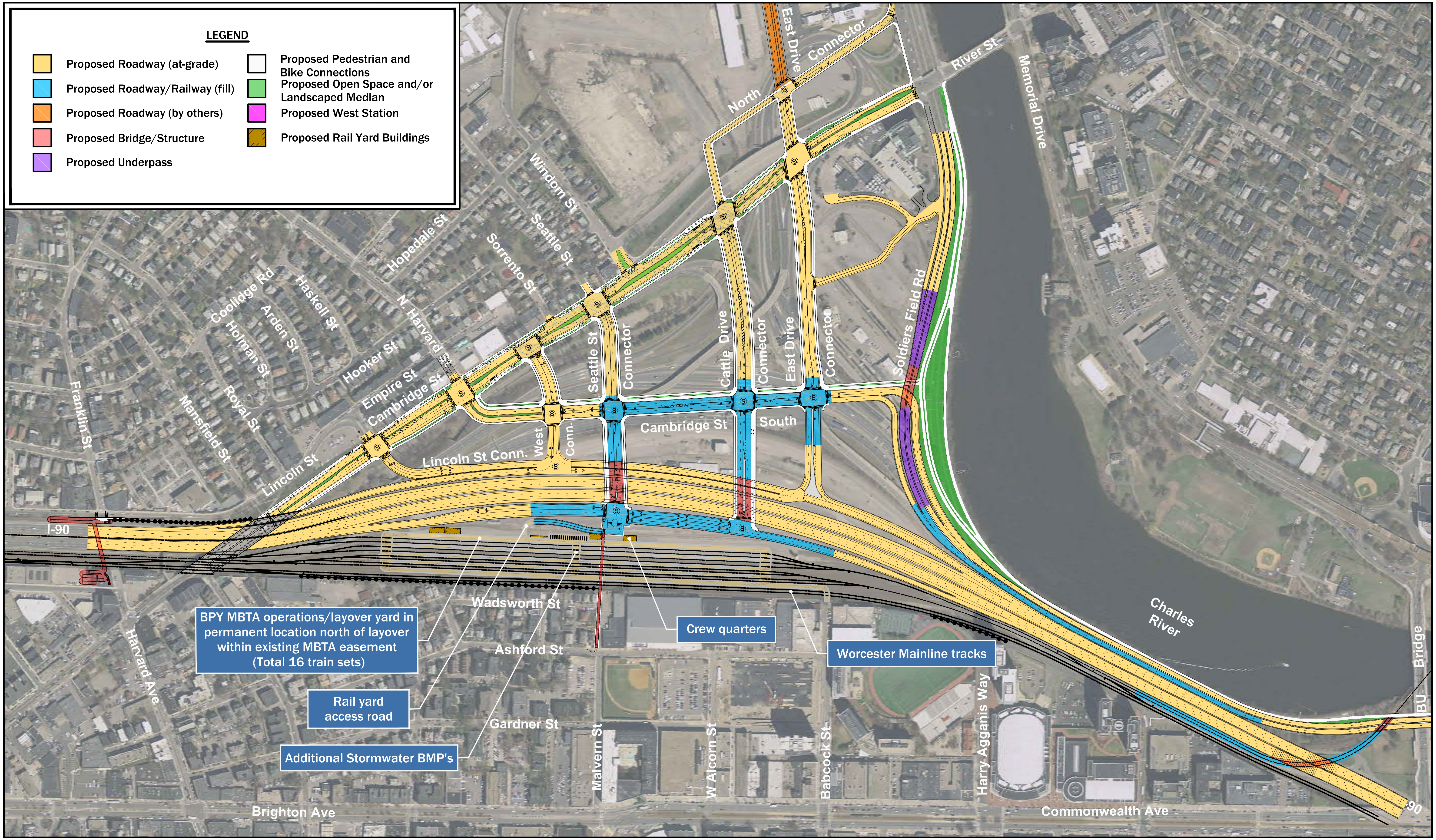
N

0 200 400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE
5.22-5

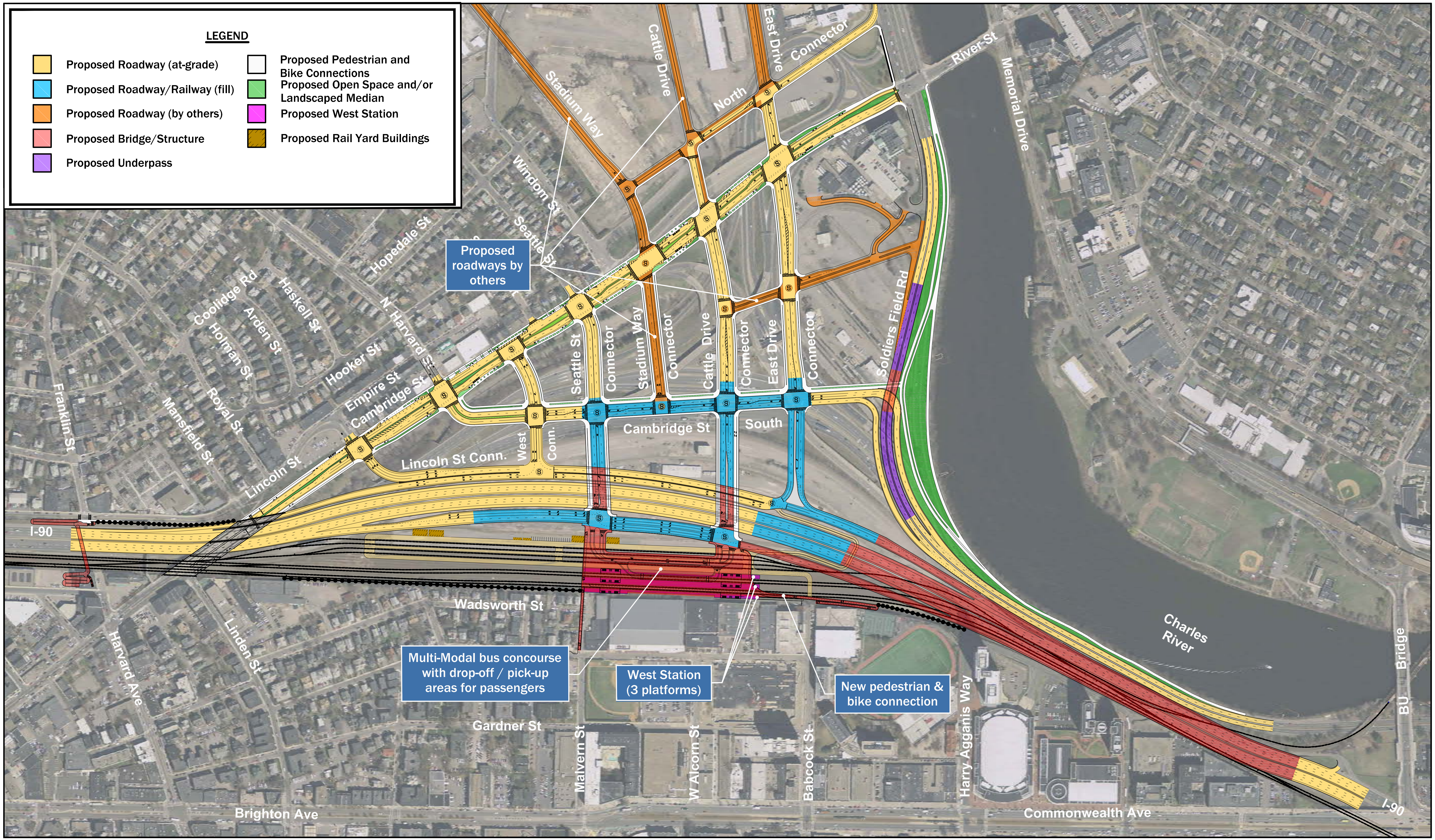
Phase 2
I-90 Urban Interchange, 3K-AMP


LEGEND
Proposed Roadway (at-grade)
Proposed Roadway/Railway (fill)
Proposed Roadway (by others)
Proposed Bridge/Structure
Proposed Underpass
Proposed Pedestrian and Bike Connections
Proposed Open Space and/or Landscaped Median
Proposed West Station
Proposed Rail Yard Buildings
East Drive
Connector
North
River St
Memorial Drive
Windom St
Seattle St
Sorrento St
Hopedale St
Coolidge Rd
Haskell St
Arden St
Holman St
N. Harvard
Hooker St
Empire St
Cambridge St
Franklin St
Mansfield St
Royal St
Lincoln St
Seattle St
Connector
Cattle Drive
Connector
East Drive
Connector
Soldiers Field Rd
Cambridge St
South
West
Conn.
Lincoln St Conn.
I-90
Wadsworth St
Ashford St
Harvard Ave
Gardner St
Charles River
Bridge
BU
BPY MBTA operations/layover yard in permanent location north of layover within existing MBTA easement (Total 16 train sets)
Rail yard access road
Additional Stormwater BMP's
Crew quarters
Worcester Mainline tracks
Malvern St
W Alcorn St
Babcock St
Harry Agganis Way
Brighton Ave
Commonwealth Ave
I-90

0 200 400
Feet

FIGURE
5.22-6

Phase 2
I-90 Urban Interchange, 3K-ABC



LEGEND

- 🟨 Proposed Roadway (at-grade)
- 🟦 Proposed Roadway/Railway (fill)
- 🟧 Proposed Roadway (by others)
- 🟥 Proposed Bridge/Structure
- 🟪 Proposed Underpass
- ☐ Proposed Pedestrian and Bike Connections
- 🟩 Proposed Open Space and/or Landscaped Median
- 🟪 Proposed West Station
- ▨ Proposed Rail Yard Buildings

Proposed roadways by others

Multi-Modal bus concourse with drop-off / pick-up areas for passengers

West Station (3 platforms)

New pedestrian & bike connection

Stadium Way
Cattle Drive
East Drive
Connector
North
River St
Memorial Drive
Windom St
Seattle St
Hopedale St
Coolidge Rd
Haskell St
Arden St
Holman St
N Harvard St
Hooker St
Empire St
Cambridge St
Franklin St
Mansfield St
Royal St
Lincoln St
Seattle St
Connector
Stadium Way
Connector
Cattle Drive
Connector
East Drive
Connector
Soldiers Field Rd
Cambridge St
South
West
Conn.
Lincoln St Conn.
I-90
Wadsworth St
Harvard Ave
Linden St
Gardner St
Malvern St
W Alcorn St
Babcock St
Harry Agganis Way
Charles River
BU Bridge
Brighton Ave
Commonwealth Ave
I-90

INTERSTATE 90 ALLSTON INTERCHANGE

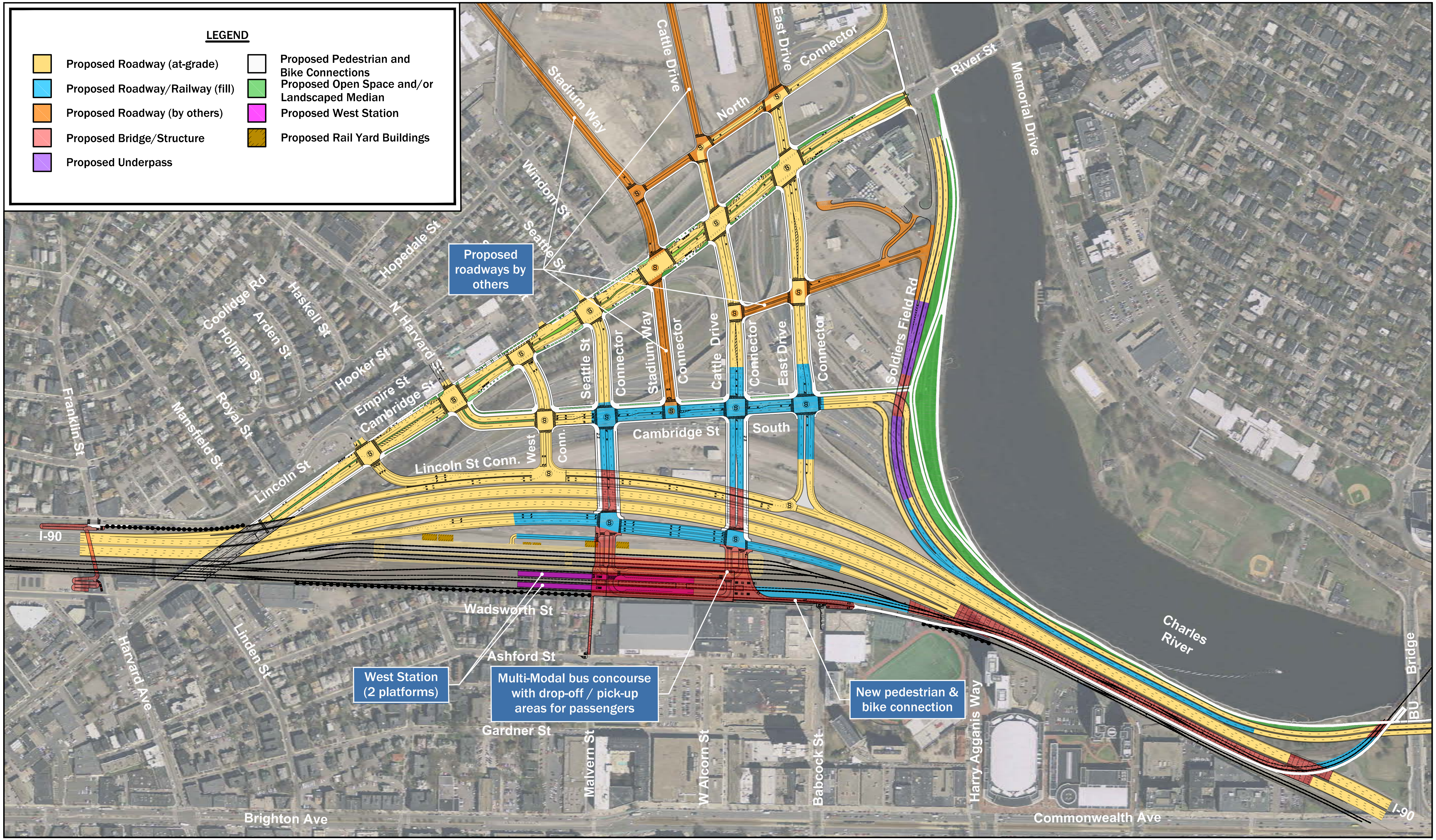
massDOT Massachusetts Department of Transportation Highway Division

0 200 400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

Phase 3
I-90 Urban Interchange, 3K-HV

FIGURE
5.22-7


LEGEND
🟨 Proposed Roadway (at-grade)
🟦 Proposed Roadway/Railway (fill)
🟧 Proposed Roadway (by others)
🟥 Proposed Bridge/Structure
🟪 Proposed Underpass
⬜ Proposed Pedestrian and Bike Connections
🟩 Proposed Open Space and/or Landscaped Median
🟪 Proposed West Station
▨ Proposed Rail Yard Buildings
Proposed roadways by others
West Station (2 platforms)
Multi-Modal bus concourse with drop-off / pick-up areas for passengers
New pedestrian & bike connection
Stadium Way
Cattle Drive
East Drive
Connector
North
River St
Memorial Drive
Windom St
Seattle St
Hopedale St
Coolidge Rd
Haskell St
Arden St
Holman St
N. Harvard St
Hooker St
Empire St
Cambridge St
Franklin St
Mansfield St
Royal St
Lincoln St
Seattle St
Connector
Stadium Way
Connector
Cattle Drive
Connector
East Drive
Connector
Soldiers Field Rd
Cambridge St
South
West
Conn.
Lincoln St Conn.
I-90
Wadsworth St
Ashford St
Linden St
Harvard Ave
Gardner St
Malvern St
W Alcorn St
Babcock St
Harry Agganis Way
Charles River
Bridge
BU
Brighton Ave
Commonwealth Ave
I-90

INTERSTATE 90 ALLSTON INTERCHANGE

massDOT Massachusetts Department of Transportation Highway Division

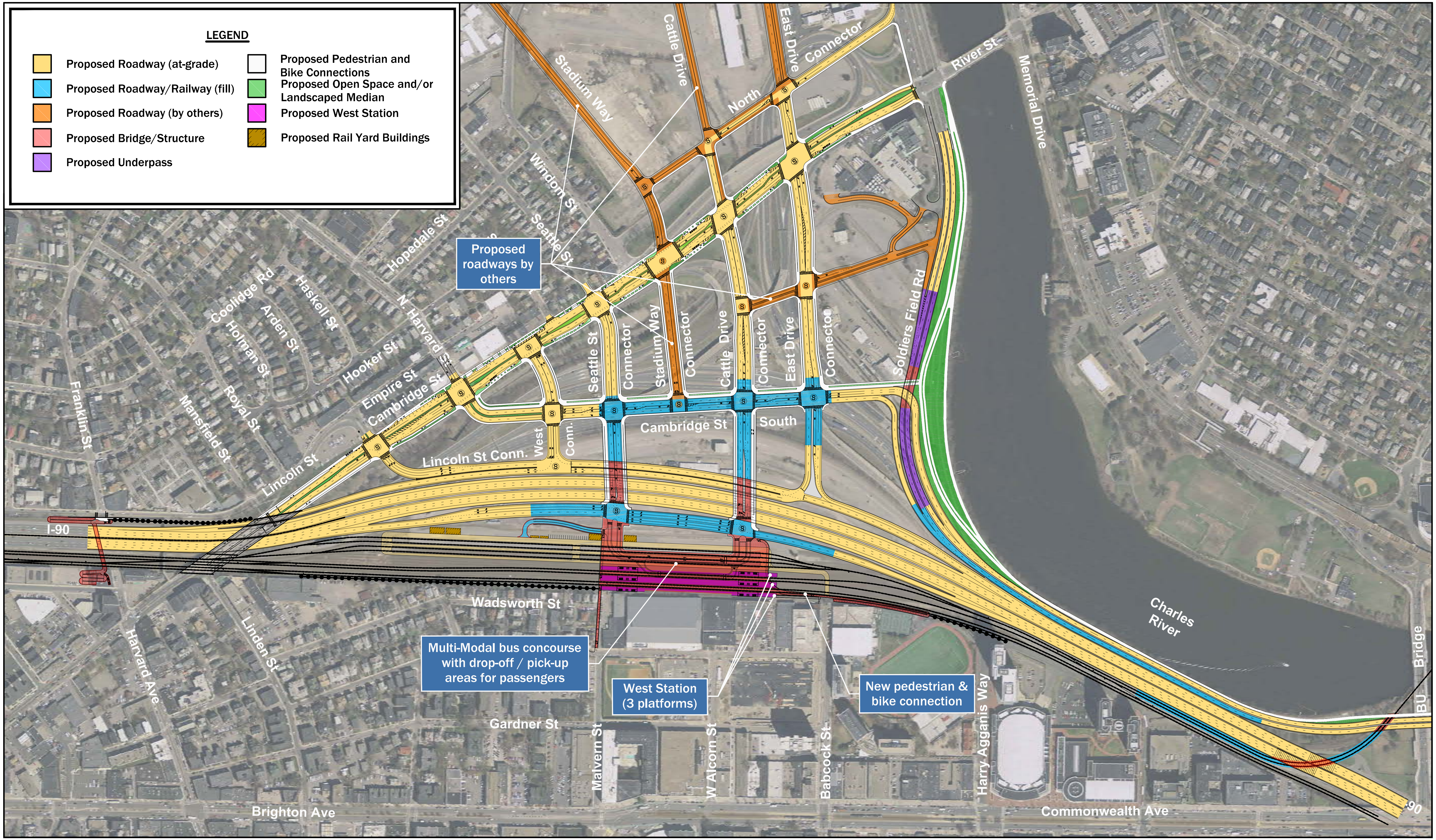
N

0 200 400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE 5.22-8

Phase 3
I-90 Urban Interchange, 3K-AMP


LEGEND
🟨 Proposed Roadway (at-grade)
🟦 Proposed Roadway/Railway (fill)
🟧 Proposed Roadway (by others)
🟥 Proposed Bridge/Structure
🟪 Proposed Underpass
⬜ Proposed Pedestrian and Bike Connections
🟩 Proposed Open Space and/or Landscaped Median
🟪 Proposed West Station
▨ Proposed Rail Yard Buildings
Stadium Way
Cattle Drive
East Drive
Connector
North
River St
Memorial Drive
Windom St
Seattle St
Hopedale St
Coolidge Rd
Haskell St
Arden St
Holman St
N. Harvard St
Hooker St
Empire St
Cambridge St
Franklin St
Mansfield St
Royal St
Lincoln St
Lincoln St Conn.
West Conn.
Seattle St
Connector
Stadium Way
Connector
Cattle Drive
Connector
East Drive
Connector
Soldiers Field Rd
Cambridge St
South
I-90
Wadsworth St
Harvard Ave
Linden St
Gardner St
Malvern St
W Alcorn St
Babcock St
Harry Agganis Way
Brighton Ave
Commonwealth Ave
Charles River
BU Bridge
I-90

Proposed roadways by others

Multi-Modal bus concourse with drop-off / pick-up areas for passengers

West Station (3 platforms)

New pedestrian & bike connection

N

0 200 400
Feet

I-90 Allston Interchange Project
Draft Environmental Impact Report

FIGURE
5.22-9

Phase 3
I-90 Urban Interchange, 3K-ABC

Law, Regulation or Program	I-90 Urban Interchange Preferred Alternative	Throat Area Variations			Rail	
		3K-HV	3K-AMP	3K-ABC	Rail Operations	West Station
Activity: Installation of Stormwater Discharge Pipes **USACE** **Rivers and Harbors Act of 1899 Section 10 and Clean Water Act Section 404** **33 CFR 325.5(c)(1) General Permits** **Massachusetts GP Self Verification (SV) Notification**	Required for stormwater discharge pipes in a navigable Water of the U.S. below Ordinary High Water (OHW). This work will be minor and expected to be approved as a Self Verification activity under Massachusetts General Permit (MGP) #9 (Utility Line Activity) and MGP #1 (Repair, Replacement, and Maintenance of Authorized Structures and Fill) for work in a Non-tidal Water of the U.S. Note: The Self Verification process only requires notification to the USACE, not a formal permit filing or approval; work may commence without written verification from the USACE.				Not Required.	
Activity: Construction of Wall and Associated Dredge and Fill **USACE** **Rivers and Harbors Act of 1899 Section 10 and** **Clean Water Act Section 404** **33 CFR 325.5(c)(1) General Permits** **Massachusetts GP Pre-Construction Notification (PCN)**	Not Required.			Required for retaining wall and associated fill and dredge for PDW Path within navigable Water of the U.S. below OHW. MGP #10 (Linear Transportation Projects and MGP #5 (Dredging), PCN. To be eligible for coverage, the project must meet a number of conditions including: Condition #4 – projects must avoid, minimize and compensate for unavoidable impacts to ensure that the net adverse effects of a project are no more than minimal; Condition #6 -- coordination under Section 106 of the National Historic Preservation Act; Condition #10 -- no interference with navigation; Condition #18 -- time of year/window restrictions; Condition #19 -- Aquatic Life Movements that requires no disruption to the migration of species and Condition #23 – avoiding and minimizing impacts to Spawning, Breeding and Migratory Areas. Note: PCN is a formal permitting process requiring detailed application, review and written approval by the USACE. Construction specifications to include provisions that work performed in federal wetland resources will comply with applicable permit conditions.	Not Required.	
Executive Order 11988: Floodplain Management, as amended by Executive Order 12148	For the I-90 Interchange Project and all Throat Area Variations, the installation/replacement of stormdrain pipes in the Charles River will result in de minimis reductions in flood storage capacity in existing floodplains due to Project construction because there is no practicable alternative location for discharging stormwater. The Project is consistent with the Executive Order.			The introduction of a retaining wall and fill within the floodplain will decrease flood storage capacity. Creation of equal amount of flood storage is required.	No floodplain alterations associated with the rail operations/West Station Project components.	

Law, Regulation or Program	I-90 Urban Interchange Preferred Alternative	Throat Area Variations			Rail	
		3K-HV	3K-AMP	3K-ABC	Rail Operations	West Station
STATE						
MHC 950 CMR 71.00	Under the state historic preservation law, “completed project review under the National Historic Preservation Act of 1966 shall ordinarily fulfill the requirements of compliance with M.G.L. c.9, §§ 26 through 27C, unless otherwise determined by the MHC [Massachusetts Historical Commission].” MassDOT anticipates, therefore, that the federal Section 106 review shall fulfill the requirements of the state historic preservation law.					
MEPA: M.G.L. c. 30, §§ 61-62H and regulations at 301 CMR 11.00. **MEPA DEIR**	This DEIR partially fulfills the statutory and regulatory requirements and the subsequent FEIR will complete the MEPA process.					
Article 97 of the Amendments to the Massachusetts Constitution	Some unavoidable impacts to Article 97 land will result from the construction of the Project regardless of which Throat Area Variation is selected. Article 97 land includes all DCR-owned property within the Project Area. Article 97 of the Amendments to the Massachusetts Constitution requires special legislative action to approve any proposed disposition of or change in use of parklands. Specifically, Article 97 requires a two-thirds roll call vote of the Massachusetts House of Representatives and the Massachusetts Senate in order to dispose of or change the use of certain public lands taken or acquired for natural resources purposes. For discussion of impacts, see Section 5.4 Open Space. For description of mitigation, see Section 7.4 Open Space.				Not Required.	
350 CMR 2.00 Use of Reservations and Parkways **DCR Construction and Access Permit**	Required for all Project components that involve work within the Charles River Reservation. All work within DCR property for all variations will be coordinated with the DCR.				Required for Relocation of portion of GJR Line under the 3K-HV Variation. GJR Bridge over SFR will require DCR access permit for construction under 3K-AMP and 3K-ABC Variations.	Not Required.
Massachusetts Public Waterways Act: M.G.L c. 91, §§ and regulations at 310 CMR 9.00. **MassDEP Chapter 91 Waterways License**	Required for all Project components located in filled tidelands and drainage improvements in the flowed tidelands of the Charles River. Chapter 91 License application will be filed. Project will result in significant net increase in publicly accessible parkland. See Sections 5.12 and 7.12, Wetlands and Waterways, for details.			Variation results in significant net increase in publicly accessible parkland. Solid Fill to support water-dependent walkway is allowed under Waterways Regulations. Required for all Project components for work in filled tidelands. Also required for fill for roadway/path and drainage improvements in the flowed tidelands of the Charles River. See Sections 5.12 and 7.12, Wetlands and Waterways, for details.	Required for relocation of portion of GJR Line under 3K-HV Variation and construction of GJR Bridge over SFR under 3K-AMP and 3K-ABC. Work will not negatively affect tidelands. See Sections 5.12 and 7.12, Wetlands and Waterways, for details.	Not Required.
MassDEP Water Quality Certification 314 CMR 9.00 Section 401 of Clean Water Act	Required where Section 404/Section 10 US ACOE approval is required. The Prefered Alternative will fill less than 5,000 sf of LUW, and will not include dredging, therefore, an Order of Conditions by the Boston Conservation Commission serves as Water Quality Certification (WQC) in accordance with regulations found at 314 CMR 9.03. No application to DEP for a WQC will be required.			Installation of a retaining wall will require dredging. Quantification of impacts associated with dredging will be determined and provided in the FEIR. If more than 100 cubic yards of dredge is proposed, then a Minor WQC will be required.	Not Required.	
MWRA Section 8(m) of Chapter 372 of the Acts of 1984 **MWRA 8(M) Permit**	MWRA Water and Sewer Easements are located in the Project Area. An 8(m) permit application will be filed with the Authority for all work within MWRA easements. Construction specifications will be prepared to ensure that MWRA facilities will be properly protected.					

Law, Regulation or Program	I-90 Urban Interchange Preferred Alternative	Throat Area Variations			Rail	
		3K-HV	3K-AMP	3K-ABC	Rail Operations	West Station
Massachusetts Department of Environmental Protection, Bureau of Air and Waste **Solid Waste Beneficial Use Determination, 310 CMR 19.00**	Reuse of demolition debris, such as coated/painted concrete, brick and similar materials, will require a Beneficial Use Determination (BUD). A BUD permit application will be prepared and submitted to MassDEP if applicable.					
Massachusetts Department of Environmental Protection, Bureau of Air and Waste **Solid Waste Site Assignment, 310 CMR 16.00**	The Project will evaluate whether establishing a Solid Waste Management Facility will be required or advantageous. If required, the Project will follow the Site Assignment Process found at 310 CMR 16.22 (2).					
Massachusetts Department of Environmental Protection, Bureau of Air and Waste **Asbestos Notification/Removal, 310 CMR 7.15**	If asbestos is detected in any structures to be demolished, the Project will submit an Asbestos Notification Form (ANF-001) at least 10 business days prior to the start of the asbestos abatement.					
Massachusetts Department of Environmental Protection, Bureau of Air and Waste **Demolition/Construction Notification, 310 CMR 7.09**	The Project will submit a Demolition/Construction Notification From (BWP AQ-06) at least 10 days prior to any demolition activity.					
Massachusetts Contingency Plan (MCP): M.G.L. c. 21E and regulations at 310 CMR 40.000.	Construction specifications will be prepared to ensure that any oil and hazardous materials contamination encountered during construction is properly addressed in compliance with the MCP.					
LOCAL AND REGIONAL PLANNING DOCUMENTS						
MWPA: M.G.L. c. 131, § 40 and Regulations at 310 CMR 10.00. **Boston Conservation Commission Order of Conditions**	Notice of Intent filing required for all Project components for stormwater discharge pipe work within LUW, Bank, Bank Underlying an Anadromous/Catadromous Fish Run and BLSF; Project components are also within the 100 foot buffer zone to Bank.			3K-ABC has additional alteration to LUW, Bank and BLSF, beyond stormwater improvements, from retaining wall and associated fill; if Bank is found to be significant to wildlife habitat, then a variance under the MA WPA may be required for the alteration of more than 50 linear feet of Bank.	Not Required.	
Charles River Master Plan	The Project will significantly enhance pedestrian and bicycle connections between the Allston neighborhoods and the PDW Path in the Charles River Basin, consistent with the DCR's Master Plan for the Basin. Consistency with the Charles River Master Plan is discussed in Section 5.4.					
Local and Regional Bike Plans	In 2013, the City of Boston issued the Boston Bike Network Plan, a 30-year master plan to expand the existing bicycle network within the city. Within the Allston neighborhood, most of the bicycle network facilities envisioned by the Boston Bike Network Plan have been implemented. The street network will provide key east/west pedestrian and bicycle connections along Cambridge Street South, accommodating a direct link between North Allston and the Charles River Reservation and PDW Path. In addition, two bridges will be constructed to form important north/south connections through the Project Area, providing accommodations between the neighborhoods north of Cambridge Street in Allston and Commonwealth Avenue in the Packards Corner area. A third bridge will replace the existing Franklin Street pedestrian bridge over I-90 and the Worcester Line, connecting North Allston with Allston village.				Not Required.	A 12-foot-wide bicycle and pedestrian bridge will be constructed to connect Malvern Street to the south with the proposed street network to the north. With eventual access to West Station also being provided from this new link, it will serve as a major pedestrian and bicycle corridor.

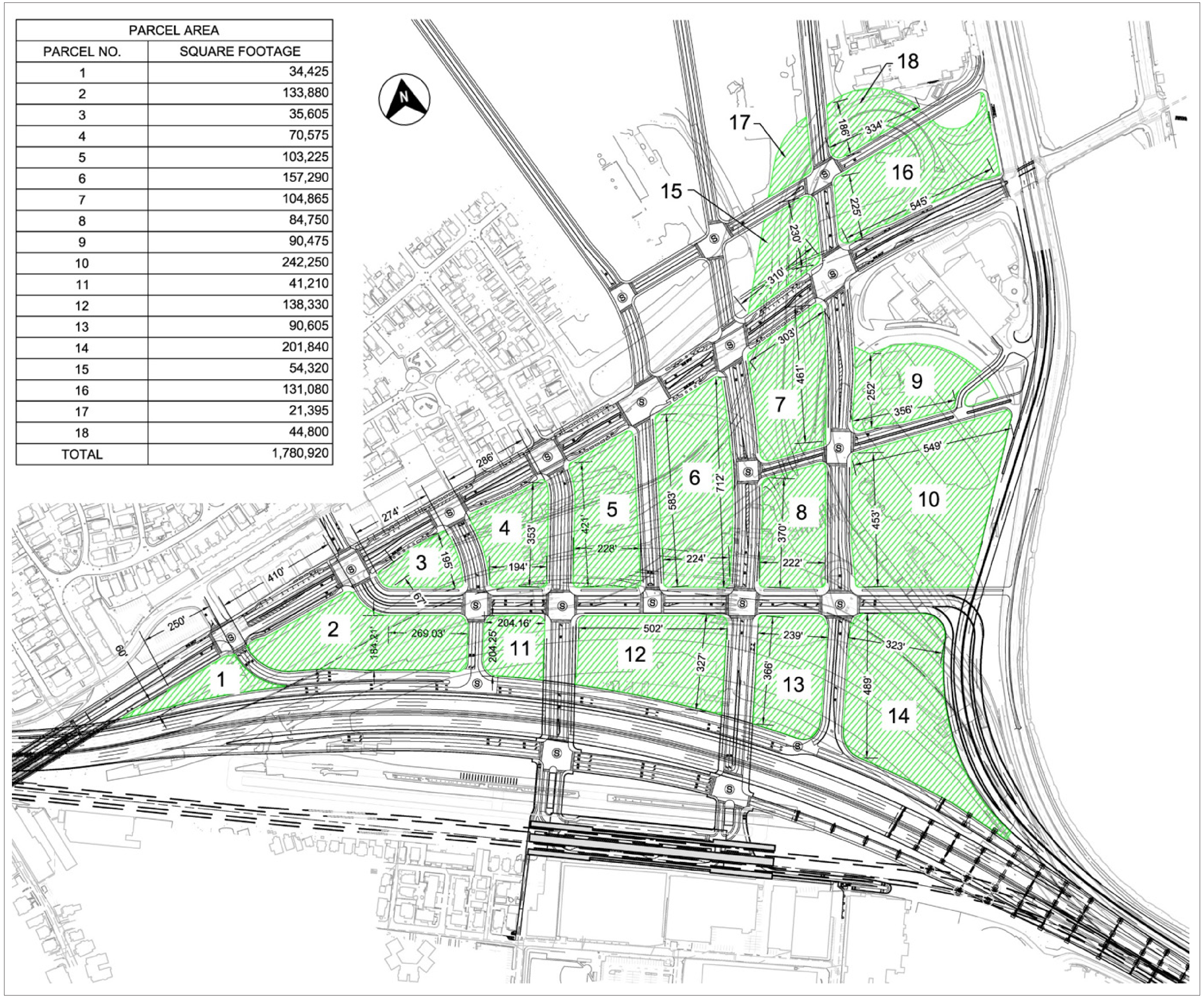
7.2 Land Use and Zoning

7.2.1 No Build

Under the No Build Alternative, the viaduct will be rehabilitated in place. No changes in land use or zoning will occur under the No Build Alternative, therefore, no mitigation will be required.

7.2.2 I-90 Urban Interchange Preferred Alternative

Regardless of the Throat Area Variation, the Preferred Alternative will have a street pattern, an I-90 mainline/ramp alignment, and the Massachusetts Bay Transportation Authority (MBTA) rail yard plan in common, as shown on Graphic 7.2-1.These common elements reflect the input of many parties with a shared goal of connecting a future mixed-use neighborhood to its immediate environment and the regional transportation network. Additional interstitial streets will be required as development proceeds.


N
1
2
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8
9
10
11
12
13
14
15
16
17
18
250'
60'
410'
274'
286'
67'
195'
194'
353'
421'
228'
583'
224'
712'
303'
461'
370'
222'
252'
356'
549'
453'
310'
230'
225'
545'
186'
334'
184.21'
269.03'
204.16'
204.25'
502'
327'
239'
366'
323'
489'

PARCEL AREA	
PARCEL NO.	SQUARE FOOTAGE
1	34,425
2	133,880
3	35,605
4	70,575
5	103,225
6	157,290
7	104,865
8	84,750
9	90,475
10	242,250
11	41,210
12	138,330
13	90,605
14	201,840
15	54,320
16	131,080
17	21,395
18	44,800
TOTAL	1,780,920

Graphic 7.2-1: Future Development Parcels

7.3 Visual

7.3.1 No Build

Under the No Build Alternative, the viaduct will be rehabilitated/replaced in the same location. There will be no change to the existing visual and aesthetic character of the Project Area, therefore, no mitigation will be required.

7.3.2 I-90 Urban Interchange Preferred Alternative

Highway

The Project will alter the existing visual landscape for travelers on I-90 as a result of proposed roadway realignment and relocation. I-90 will continue to exhibit a developed highway environment similar to the existing facility, but the softening of highway curvature and the addition of shoulders will lengthen sight lines and expand offsets to adjacent obstructions.

The perspective of the I-90 interchange from Cambridge Street will be altered as I-90 itself will be shifted further to the south, more distant from Cambridge Street, and consequently less visible. The existing ramp structures will be removed, Cambridge Street will be lowered to existing grade, and the street will be straightened, creating a continuous view and an improved sense of visual orientation. The visual environment will change from a multi-level highway interchange to a walkable commercial or residential street.

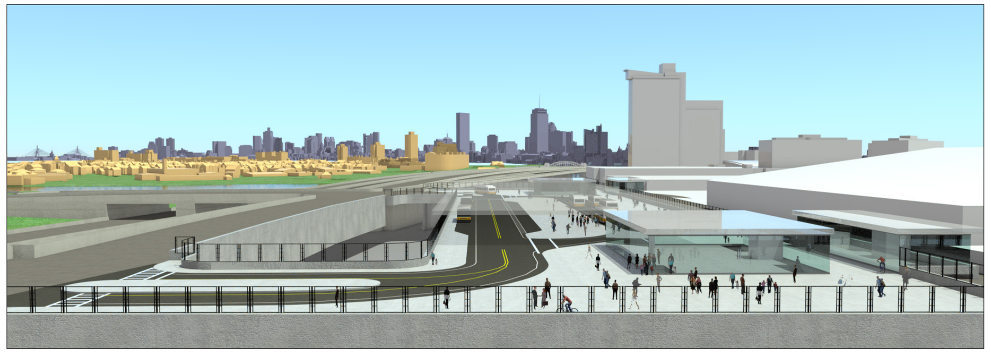
Soldiers Field Road (SFR) will be relocated to the west, and the resulting parkland along the Charles River Reservation will provide a “visual gateway” to the Project Area for drivers approaching from both the north and the south, as well as for pedestrians and bicyclists on the Dr. Paul Dudley White Bike Path (PDW Path).

Rail Operations

The proposed development will be consistent with existing rail uses and will not substantially change the visual character of the site.

West Station

The station platforms alone will not substantially change the visual character of the Project Area because they will be limited in height and visually consistent with other elements currently in the rail yard. However, the proposed station will change the visual massing present on the existing rail yard, as shown on Graphic 7.3-1.

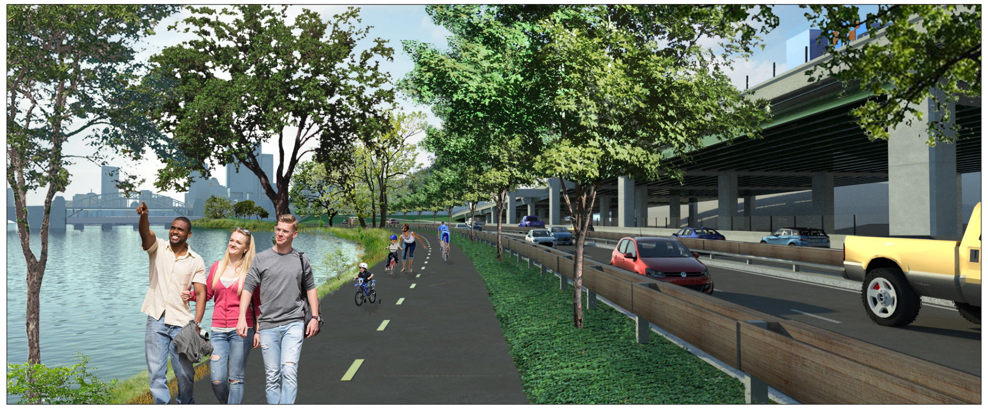


Graphic 7.3-1: West Station view looking east toward downtown Boston skyline

7.3.3 Throat Area Variations

3K-HV Variation

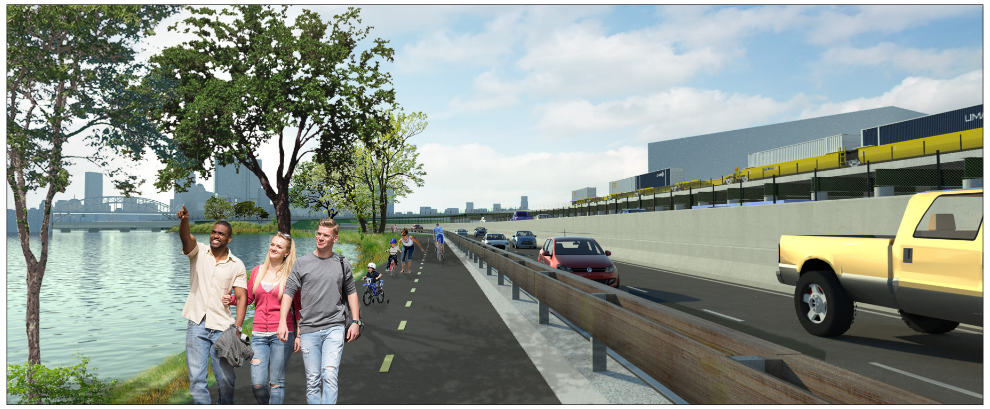
The 3K-HV Variation will not change the existing visual and aesthetic character of the Project Area because the viaduct will be replaced in the same location. However, views of the elevated viaduct area will be softened by a widened landscape buffer along the PDW Path, as shown in Graphic 7.3-2.



Graphic 7.3-2: Conceptual rendering of the 3K-HV Variation looking east towards downtown Boston from the Throat Area

3K-AMP Variation

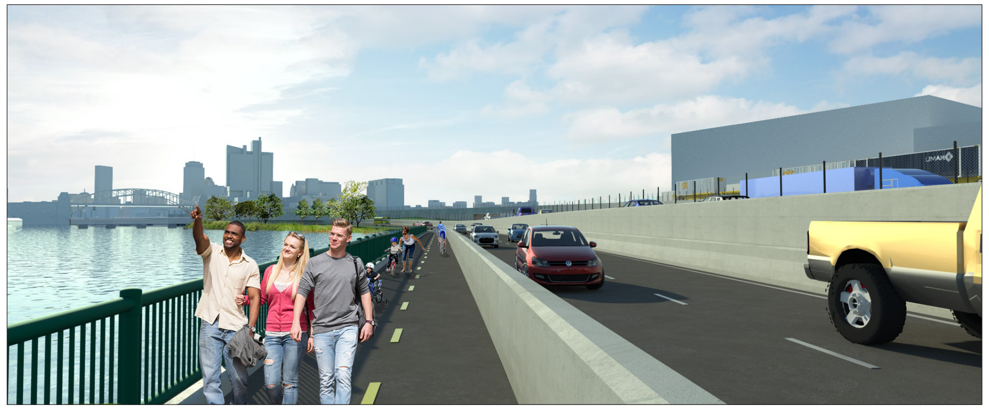
Under the 3K-AMP Variation, shown in Graphic 7.3-3, the Grand Junction Railroad (GJR) Line will be elevated through the Throat Area on a new structure, and the highway will be constructed at grade. The rail viaduct will have less visual impact on PDW Path users than the 3K-HV Variation, as it will be lower in elevation and farther away from the river than the I-90 viaduct. Partial separation between PDW Path and SFR will allow for a landscaped buffer east and west of the narrowest section of the Throat Area. Westbound SFR will be at the same elevation as I-90, but the eastbound SFR lanes will be elevated on a retained fill section. At its highest point, the retaining wall will partially screen eastbound SFR, I-90, and the rail viaduct, and it will be a prominent visual element for those using the PDW Path.



Graphic 7.3-3: Conceptual rendering of the 3K-AMP Variation looking east towards downtown Boston from the Throat Area

3K-ABC Variation

Under the 3K-ABC Variation, as shown on Graphic 7.3-4, the viaduct will be removed and the highway will be constructed at grade between the rail lines and SFR. Removal of the viaduct will open up views of the Charles River from the Boston University (BU) area. The elevated portion of the GJR will have even less visual impact on PDW Path users, as it will be lower in elevation and farther away from the river than the I-90 viaduct in 3K-HV and rail viaduct in 3K-AMP. Partial separation between PDW Path and SFR will allow for a landscaped buffer east and west of the narrowest section of the Throat Area. Westbound SFR will be at the same elevation as proposed with 3K-AMP, but the eastbound SFR lanes will be elevated on a retained fill section. At its highest point, the retaining wall will partially screen eastbound SFR, I-90, and the elevated portion of the GJR, and it will be a prominent visual element for those using the PDW Path.



Graphic 7.3-4: Conceptual rendering of the 3K-ABC Variation looking east towards downtown Boston from the Throat Area

7.4 Open Space and Recreation

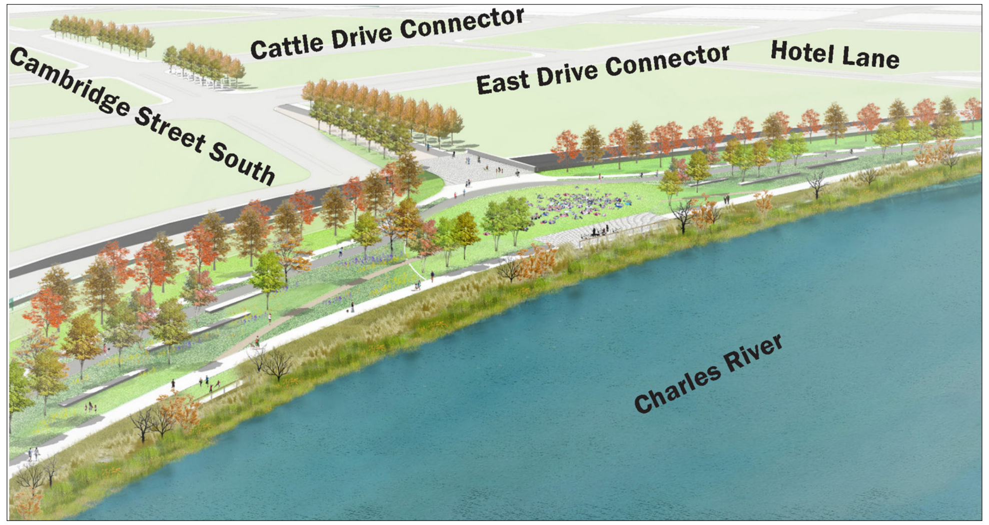
7.4.1 No Build

The City of Boston’s Open Space and Recreation Plan cites I-90 and SFR as barriers to the Charles River Reservation open space, and between the neighborhoods to the north and to the south of I-90. Under the No Build, this situation will continue to be a barrier.

7.4.2 I-90 Urban Interchange Preferred Alternative

The I-90 Urban Interchange Preferred Alternative will allow for north/south connections through the Project Area for pedestrians and bicyclists by providing connections from North Allston and neighborhoods to the north with neighborhoods and open space to the south. The Project includes sidewalks and separated bike lanes on both the Seattle Connector, connecting to Malvern Street, and on the Cattle Drive Connector, connecting to Babcock Street. Both connections pass through West Station.

Cambridge Street and Cambridge Street South will be designed as Boston Complete Streets (i.e., recommended to be “multi-modal, green and smart”). The design will include sidewalk-level, separated bicycle lanes, sidewalks, and street tree plantings to help buffer sidewalk and bike lane users from vehicular traffic. There will be many intersections on both streets, and they will be designed to allow for safe crossing. Cambridge Street is identified in Boston’s Complete Streets guidelines as a Neighborhood Connector, connecting neighborhoods in Allston, Brookline and Cambridge, and will be designed accordingly. Cambridge Street South will be a new connector, and it will also serve as the primary pedestrian and bicyclist connection from neighborhoods to the north and south of I-90 to the Charles River Reservation. A significant Project open space opportunity will be the expansion of the parklands along the Charles River adjacent to the Project, and improved access from the surrounding neighborhoods along the north side of Cambridge Street South, as shown in Graphic 7.4-5. At its widest point, the parkland will expand from 14 feet to 155 feet in width, which is similar in scale to the Esplanade Play Space along the river. In addition, the expanded parkland will allow for new separated bicycle and pedestrian paths along the Charles River.



Graphic 7.4-1: New Parkland along Charles River

The park uses and associated programs will be designed in coordination with the Massachusetts Department of Conservation and Recreation (DCR) and the community. The park will be a destination along the PDW Path, large enough for a variety of neighborhood-scale events and activities. The removal of the vehicular ramp to Cambridge Street/River Street, and its replacement with separated bicycle and pedestrian paths, will make it easier to navigate a very difficult section of the bicycle path (the Narrows). It will also create a safer and stronger connection to River Street and Magazine Beach, and to new walking and bicycling facilities along Cambridge Street.

The tree-lined bicycle and pedestrian way to the north of Cambridge Street South will connect at grade with the park, as SFR passes under, greatly improving neighborhood access to the expanded parklands and to the improved PDW Path.

Article 97

For the 3K-HV Variation, piers to support I-90 and a portion of a relocated track approach to the GJR Bridge will occupy 15,250 square feet (sf) of DCR property. Both the 3K-AMP and 3K-ABC Variations locate a portion of I-90 at grade within DCR property. The 3K-AMP Variation will occupy 24,000 sf of DCR property and the 3K-ABC Variation will occupy 47,000 sf.

The impact to Article 97 land is unavoidable due to space constraints, however the reconstruction of I-90 will essentially be in the same location, only the width varies based on the selected Throat Area Variation.

Although all three Throat Area Variations will result in impacts to Article 97 land, the removal of the Houghton Rail Spur will allow for the creation of new usable public parkland and open space. Compensation for impacts to Article 97 lands will include the following for each Throat Area Variation:

- 3K-HV: 3.59 acres (1.07 acres of open space parkland and 2.52 acres of relocated SFR)
- 3K-AMP: 3.53 acres (1.16 acres of open space parkland and 2.37 acres of relocated SFR)
- 3K-ABC: 3.22 acres (0.93 acres of open space parkland and 2.31 acres of relocated SFR)

Section 4(F) Lands

A significant Project open space opportunity will be the expansion of the parklands along the Charles River adjacent to the Project site, and improved access from the surrounding neighborhoods along the north side of Cambridge Street South.

Table 7.4-1: Summary of Potential Parkland Expansion

Variation	Net Open Space (acres)*
3K-HV	7.3 acres: 3.59 transferred to DCR, 3.71 new open space
3K- AMP	7.3 acres: 3.53 transferred to DCR, 3.77 new open space
3K-ABC	6.6 acres: 3.22 transferred to DCR, 3.38 new open space

**Net Open Space includes new open space within DCR property and property to be transferred to DCR, including the relocated Soldiers Field Road.*

7.5 Socioeconomics

No mitigation will be required.

7.6 Historic and Archaeological

Mitigation for effects on historic and archaeological resources is required only if the FHWA has determined, after consultation with the State Historic Preservation Officer (SHPO) and in compliance with the regulations implementing Section 106 of the Historic Preservation Act of 1966, that the Project will have an adverse effect on historic properties and that there are no alternatives that will avoid or minimize that effect. In the event of an adverse effect finding, FHWA will continue consultation with the SHPO, MassDOT, and any designated consulting parties to develop a Memorandum of Agreement that records the terms and conditions agreed upon to resolve the adverse effects on historic properties.

7.6.1 No Build

Under the No Build Alternative, the existing I-90 viaduct will be rehabilitated in place and it will not result in adverse effects on historic properties. Therefore, no mitigation will be required.

7.6.2 I-90 Urban Interchange Preferred Alternative

The I-90 Urban Interchange Preferred Alternative will involve no acquisition of historic properties; however, it will have an effect upon the National Register-listed (NR-listed) Charles River Basin Historic District and the Harvard Avenue Historic District. As discussed in Section 5.4.5, shifting SFR away from the river and constructing an underpass for SFR is intended to add parkland to the historic district and provide increased pedestrian access. A new pedestrian bridge over I-90 at Franklin Street will be constructed outside of, but adjacent to, the bounds of the Harvard Avenue Historic District. It is MassDOT's intention to sensitively design these changes to avoid any adverse effects on the characteristics which make the Charles River Basin and Harvard Avenue Historic Districts NR-eligible. If these changes are found to have no adverse effect on the historic districts, then a de minimis finding could be made under Section 4(f).

7.6.3 Throat Area Variations

3K-HV Variation

The 3K-HV Variation will require the smallest amount of taking from the historic district and will most closely retain the existing character of the area. The vegetated strip between SFR and the viaduct/rail will be shifted to a more accessible location between the PDW Path and SFR where vegetation will have more favorable growing conditions. While some viaduct piers will encroach within the historic district, the overall effect will be minor and have minimal effect on the characteristics which make the historic district eligible for NR-listing. Although the GJR rail approach to the GJR Bridge will be realigned, 3K-HV is the only variation that will avoid the removal of the historic GJR Bridge over SFR and the replacement with a new bridge.

3K-AMP Variation

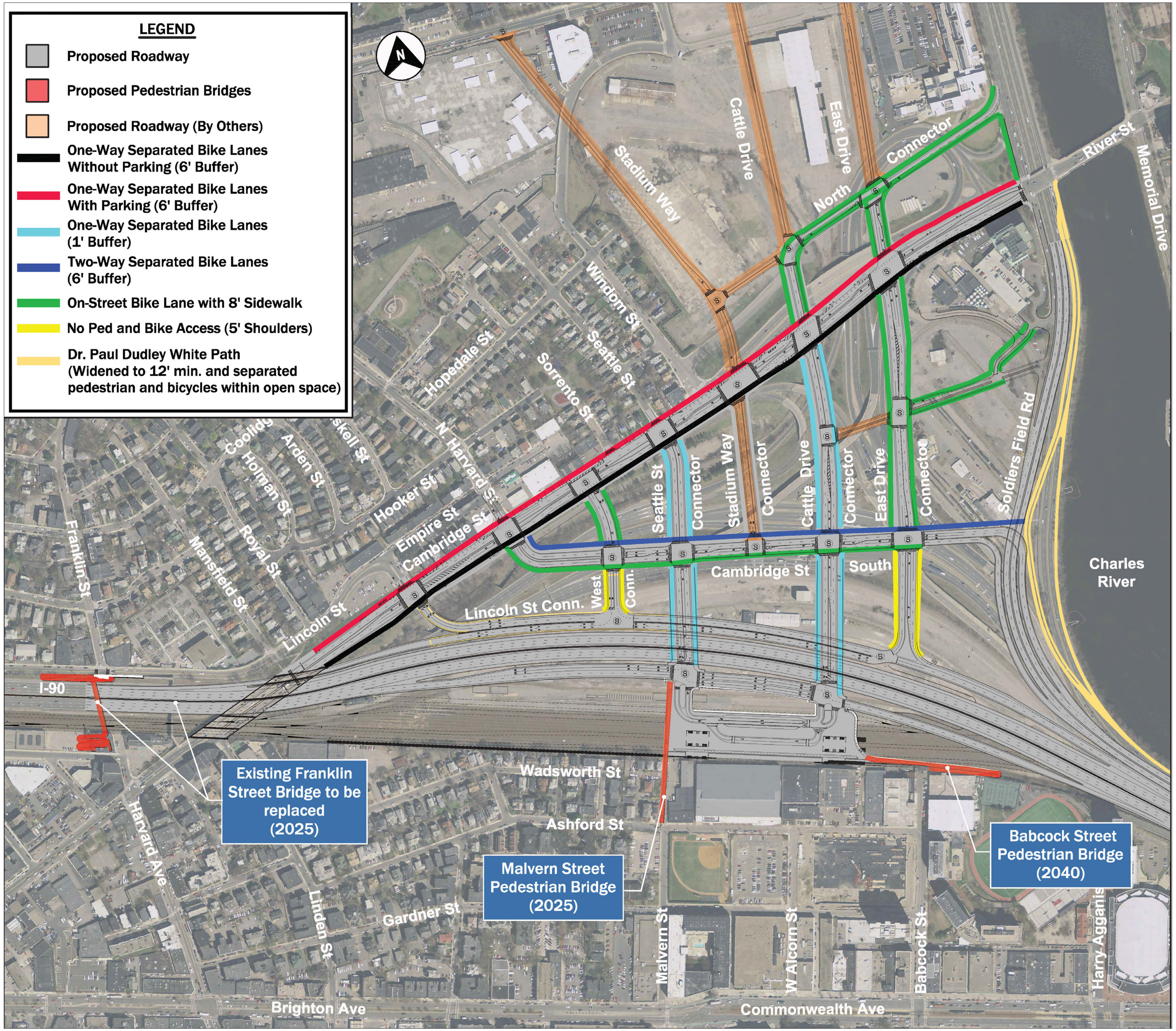
The 3K-AMP Variation requires a greater taking from the historic district than the 3K-HV Variation but less than the 3K-ABC Variation. The interstate will be shifted directly into the historic district. It will retain a viaduct but it will be lower and farther from the district than the 3K-HV Variation. Vegetation at the Charles River embankment will remain and a new vegetated strip will provide a buffer between the PDW and SFR in a partial section of the Throat Area. This variation will require the removal of the historic GJR Bridge over SFR and the replacement with a new bridge. The removal of a contributing structure within a historic district is generally considered an Adverse Effect under Section 106.

3K-ABC Variation

The 3K-ABC Variation will require a more substantial taking from the historic district and shift the interstate directly within the historic district. All vestiges of the parkway will be lost by the removal of all vegetation within the Throat Area. The main advantage of this alternative is the removal of a viaduct structure, but this advantage will be somewhat lessened by the built environment that will still be the southern backdrop of the historic district. 3K-ABC will also require the removal of the historic GJR Bridge over SFR and the replacement with a new bridge. over SFR. The removal of a contributing structure within a historic district is generally considered an Adverse Effect under Section 106. Of the three Throat Area Variations, 3K-ABC will have the most significant effect on the characteristics which make the Charles River Basin Historic District eligible for listing in the National Register.

7.7 Pedestrian and Bicycle

Extensive improvement to both pedestrian and bicycle accommodations will be provided by the Project. These improvements are shown on Graphic 7.7-1.


LEGEND
Proposed Roadway
Proposed Pedestrian Bridges
Proposed Roadway (By Others)
One-Way Separated Bike Lanes Without Parking (6' Buffer)
One-Way Separated Bike Lanes With Parking (6' Buffer)
One-Way Separated Bike Lanes (1' Buffer)
Two-Way Separated Bike Lanes (6' Buffer)
On-Street Bike Lane with 8' Sidewalk
No Ped and Bike Access (5' Shoulders)
Dr. Paul Dudley White Path (Widened to 12' min. and separated pedestrian and bicycles within open space)
N
Stadium Way
Cattle Drive
East Drive
North
Connector
River St
Memorial Drive
Windom St
Seattle St
Sorrento St
Hopedale St
N Harvard St
Hooker St
Empire St
Cambridge St
Coolidge
Holman St
Arden St
Royal St
Mansfield St
Franklin St
Lincoln St
Stadium Way
Connector
Cattle Drive
Connector
East Drive
Connector
Soldiers Field Rd
Seattle St
Cambridge St
South
Lincoln St Conn.
West
Conn.
Charles River
I-90
Existing Franklin Street Bridge to be replaced (2025)
Wadsworth St
Ashford St
Malvern Street Pedestrian Bridge (2025)
Babcock Street Pedestrian Bridge (2040)
Harvard Ave
Linden St
Gardner St
Malvern St
W Alcorn St
Babcock St
Harry Agganis
Brighton Ave
Commonwealth Ave

Graphic 7.7-1: Pedestrian and Bicycle Plan

7.8 Traffic and Safety

7.8.1 I-90 Urban Interchange Preferred Alternative and Throat Area Variations

Traffic Monitoring Program

Traffic monitoring equipment/devices will be incorporated into the design of the Project so that traffic volumes and congestion can be continuously monitored by MassDOT and the Boston Transportation Department (BTD) within the interchange area. These measures apply to the I-90 Urban Interchange Preferred Alternative and the three Throat Area Variations. The monitoring program will include elements such as:

- **Continuous traffic counting equipment on the I-90 eastbound and westbound on- and off-ramps.** The equipment will provide MassDOT with hourly and daily traffic volumes on the ramps system for future planning purposes. It will also provide the data necessary to determine if signal timing adjustments at the ramp signals may be warranted in the future as the area is built-out.
- **Continuous traffic counting equipment on the relocated SFR on and off ramps.** The equipment will provide MassDOT with hourly and daily traffic volumes on the ramps for future planning purposes and the data necessary to determine if signal timing adjustments at the intersection of SFR ramps/Cambridge Street South/East Drive may be warranted in the future as the area is built-out.
- **Queue detection equipment on the I-90 eastbound and westbound off ramps.** The equipment will be tied into ramp signal operations to prevent queues on the off-ramps from extending back onto the I-90 mainline and impeding operations on that facility.
- **Queue detection equipment on the SFR westbound off ramp to Cambridge Street South.** Equipment will be tied into the ramp signal operations at the intersection of the SFR ramps and Cambridge Street South/East Drive to prevent back-up onto the SFR westbound mainline.
- **Real-time traffic monitoring devices such as Pan Tilt Zoom (PTZ) cameras.** Devices will be installed at strategic locations along the Cambridge Street and Cambridge Street South corridors. PTZ cameras will also be installed at the signals on the I-90 eastbound and westbound ramps. The responsibility for these cameras will be turned over to the BTD after installation, and the cameras will be tied into the BTD's Traffic Management Center at City Hall. BTD staff will be able to monitor traffic along the corridors and adjust signal timings in order to respond to congestion or incidents along these corridors in real-time.

These elements of the traffic monitoring program can be incorporated into the Project's design regardless of the Throat Area Variation constructed.

Transportation Demand Management

Implementation of a Transportation Demand Management (TDM) program will be the responsibility of Harvard University Beacon Yards, LLC, the land owner/developer of the Beacon Park Yard (BPY). The specific elements of the TDM program, including monitoring intersection operations, mode-share goals and mode-share monitoring (i.e., measuring the bicycle, pedestrian and transit mode uses at future land uses in the BPY), will be negotiated and codified in Transportation Access Plan Agreements (TAPAs) with the BTD and Section 61 Findings with MassDOT. These agreements and findings will be developed and finalized as part of the developer's project permitting processes with the City of Boston and MassDOT.

7.8.2 Maintenance of Traffic

The following construction-period traffic mitigation measures apply to the I-90 Urban Interchange Preferred Alternative and the three Throat Area Variations, as well as the No Build scenario.

An essential element of all highway construction projects is providing for the safe passage of vehicles, pedestrians, cyclists and transit operations through the work zone. This includes persons with disabilities in accordance with the Americans with Disabilities Act (ADA) of 1990. Equally as important to the mobility of road users is the safety and protection of construction workers performing tasks within the work space.

Consistent with MassDOT policy, the reconstruction of Cambridge Street and the Allston Interchange will include a variety of temporary traffic control (TTC) measures depending on the particular work element being performed and the time of day. When the normal function of the highway, roadway, sidewalk, bike path or transit way are suspended for reconstruction, TTC planning provides for the appropriate notification to the public, for the continuity of movement along roadways, and for access to private property and commercial businesses.

The FHWA's *Manual on Uniform Traffic Control Devices* (MUTCD), includes the following guidance:

> *"Consideration for road user safety, worker and responder safety, and the*
> [redacted]

TTC plans, and the variety of devices used for the Project, will be consistent with local and industry-wide standards. The final Design/Build Contractor will ultimately be responsible for implementing the TTC plans, upon approval by the MassDOT or the controlling jurisdiction (Boston, Cambridge, DCR, etc.).

The MUTCD and MassDOT's *Standard Details and Drawings for the Development of Temporary Traffic Control Plans* will offer the primary guidance on the TTC. Unknown at this time are the Design/Build Contractor's Means and Methods for the Project, road conditions, duration of operations, and physical constraints to the work area. However, the MUTCD and MassDOT guide books cover the majority of situations likely to be encountered, such as lane closures, merges, detours, sidewalk and bike lane construction. They also provide flexibility in implementing these devices to suit the situation at hand. Special attention will be paid to non-motorized users and persons with disabilities, as all temporary routes must meet ADA guidelines.

The Project will closely coordinate with the MBTA or other transit service providers for the temporary relocation of transit stops and bus shelters. A project of this magnitude will also include a robust public outreach component to inform road users of the reconstruction work and planned mitigation.

7.9 Rail

The Worcester Main Line provides an important railroad link between western Massachusetts and Boston. Maintaining service on this line during construction is critical for daily commuters. To maintain this service, proposed mitigation measures include the use of single-track operations for the section of track within the Project limits, railroad flaggers for the safety of construction crew and passengers, and additional track protection. The implementation of sequenced staging, track cutovers between existing tracks and new tracks, and the construction of new Control Points (CPs), will mitigate potential impacts to train operations and schedules for the duration of construction.

After construction, the new CPs with additional turnouts and crossovers will help to maintain current track speeds, provide connections between the additional tracks, and enhance overall operational flexibility for Worcester Main Line operations.

7.10 Air Quality / Greenhouse Gas

This section discusses the proposed mitigation measures that will reduce air quality and greenhouse gas (GHG) impacts associated with the Project.

7.10.1 I-90 Urban Interchange Preferred Alternative

Highway

As described in Section 5.10, the pollutant emissions for the 2040 Build Alternative are higher by an average of 17% when compared to the pollutant emissions for the 2040 No Build Alternative. A transportation air quality analysis typically includes an examination of TDM measures that will reduce new employment-based trips generated by a project. However, a multi-modal project such as this, which includes West Station, does not fit that mold because the Project is itself a transportation mitigation measure, not a generator of employment-based trips.

As a new multi-modal transit hub, West Station will shift the mode share of motor vehicle trips in the Allston/Brighton neighborhoods toward transit. Thus, the 2040 Build with Mitigation Alternative represents future traffic volumes, including the expected mode shift effects. The 2040 Build without mitigation case reflects future conditions without the favorable mode shift, and TDM vehicle trip reductions are the projected mode-share shift.

The BTD recently released projections of traffic volumes and commuter mode share by neighborhood for the year 2030. The projected trips and mode shares for the Allston/Brighton neighborhoods in 2030 assume the benefits of the West Station project, which will provide access to express buses serving the Longwood Medical and Academic Area (LMA), Kendall and Harvard Squares, and commuter rail service into downtown Boston and out to Newton. As a new rail and bus transit hub, West Station will favorably shift mode share from motor vehicle to transit.

Using BTD's existing commuter mode share data for the Allston and Brighton neighborhoods, and then applying their trip growth rates for single occupancy vehicles and transit for the year 2030, the results reveal an approximate 7% shift from motor vehicle to transit for both Allston and Brighton commuter trips in 2030. These results suggest that West Station, with its numerous pedestrian and bicycle connections to the Allston/Brighton neighborhoods, has the potential to affect a 7% reduction in mode share away from motor vehicles, and to transit, in the Build Year of 2040. Thus, the assumed TDM effect of the Project is to reduce air quality transportation emissions by approximately 7%.

Rail Operations

The U.S. EPA's *Locomotives Exhaust Emission Standards*, which are codified at 40 CFR Part 1033.101, include several sets of emission standards based on the date a locomotive is first manufactured or remanufactured. These standards for locomotives set upper limits for pollutant emissions per unit fuel burned or per unit of work expended. The limits are organized into tiers, (Tier 0 through Tier 4), based on the years of implementation. To be conservative, all existing passenger and freight locomotives were assumed to comply with the U.S. EPA's Tier-1 emission standards for the 2015 Existing Conditions. The more stringent Tier-4 emission standards were used for locomotives in the 2040 No Build and Build Alternatives. The F40PH-2C locomotive with a 3,000 horsepower (hp) EMD 16-645E3B engine was selected as the representative engine for all existing locomotives. For the No Build and Build Conditions in 2040, it was assumed that all locomotives would be in compliance with the Tier 4 standards. Between Tier 1 and Tier 4, there is a very large reduction in emission limits: 82% for nitrogen oxides (NOx), 86% for particulate matter (PM) and 75% for hydrocarbons (HC). The MBTA is also planning to use electric plug-in heaters to eliminate idling locomotive engines in the BPY layover area during winter months. This results in approximately an average 8% reduction in pollutant emissions.

A discussion of other potential locomotive emissions reductions is presented in Appendix F, Air Quality Technical Analysis.

West Station

GHG emissions for the Project will be reduced by the following building design and operational energy efficiency measures (EEMs):

- Using LED lighting for the station lighting systems (a lower light power density);
- Installing high-efficiency elevators; and
- Constructing the bus depot canopy as solar ready.

MassDOT commits to the carbon dioxide (CO_2) reduction presented below, but retains the flexibility to achieve this goal using EEMs that may be refined at the stage of detailed design. Table 7.10-1 reveals that the Mitigation Alternative will reduce stationary sources CO_2 emissions by 36.5%, compared to the Base Case. The Mitigation Alternative also exceeds the requirements of the Stretch Code, which references the IECC 2015 code including Section C406.3 that requires lower light power density lighting.

As discussed in Section 7.10.1, the TDM effect is to reduce Project-related motor vehicle CO_2 emissions by approximately 7.0%. The net reduction of the Project's total CO_2 emissions, (stationary sources plus transportation), is 19.8% compared to the Base Case. The net reduction of 19.8% advances MassDOT's targeted reductions in transportation sector GHG emissions, as stated in the Massachusetts Clean Energy and Climate Plan (7.6% by 2020 and 12.3% by 2050).

At the completion of construction, MassDOT will provide a certification to the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA), signed by an appropriate professional. The certification will state either of the following: (1) all of the energy efficiency mitigation measures adopted by the Project as part of the Mitigation Alternative have been implemented; or (2) an equivalent set of energy efficiency mitigation measures designed to achieve the same percentage reduction in CO_2 emissions as the Mitigation Alternative, based on the same modeling assumptions in this report, have been adopted or installed.

Table 7.10-1: Greenhouse Gas (CO_2) Emissions Summary West Station

Source	Base Case	Mitigation Alternative	Change in GHG Emissions
Direct Emissions	0	0	N.A.
Indirect Emissions	123.6	78.5	-36.5%
Subtotal Direct and Indirect Emissions	**123.6**	**78.5**	**-36.5%**
Transportation Emissions	105.3	105.0	-0.3%
Total CO_2 Emissions	**228.9**	**183.5**	**-19.8%**

(tons per year) and N.A.

7.10.2 Throat Area Variations

3K-HV, 3K-AMP and 3K-ABC

The results of the $PM_{2.5}$ hot spot analysis and NO_2 air dispersion modeling analysis demonstrates that none of the three Throat Area Variations will create a new violation of the National Ambient Air Quality Standards (NAAQS), none will increase in the frequency or severity of any existing violations, and none will delay the attainment of any NAAQS. Thus, no mitigation is required.

7.10.3 Summary of I-90 Urban Interchange Preferred Alternative and Throat Area Mitigation

Project Mitigation

As a new rail and bus transit hub, West Station will favorably shift mode share from motor vehicle to transit. The assumed TDM effect of the Project is to reduce CO_2 transportation emissions by approximately 7%. The MBTA is also planning to use electric plug-in heaters to eliminate idling locomotive engines in the BPY layover area during winter months. This results in approximately an average 8% reduction in pollutant emissions.

Table 7.10-2 presents a summary of pollutant emissions for the 2040 Build with Mitigation Alternative for all three Throat Area Variations. The net result is, on average, a 2.1% reduction in pollutant emissions when comparing the 2040 Build Alternative with the 2040 No Build Alternative.

As described in Section 5.10, volatile organic compounds (VOC) and fine particulate matter ($PM_{2.5}$) emissions from the 2040 No Build Alternative to the 2040 Build Alternative result in a total increase of mobile source air toxics (MSAT) surrogates of 18%. Applying the same emissions 7% reduction for motor vehicle emissions and 8% for eliminating idling diesel locomotives in the BPY layover area, Table 7.10-2 presents 2040 Build with Mitigation Alternative VOC and $PM_{2.5}$ for the Project. The changes in VOC and $PM_{2.5}$ emissions mimic the changes in MSATs.

Project-related VOC emissions for the three Throat Area Variations in 2040 with mitigation are estimated to be 4.14 tons per year (tpy). When compared to the VOC emissions for the 2040 Build without Mitigation of 4.18 tpy, the VOC emissions for the 2040 Build with Mitigation decrease by 1.0%. Project-related $PM_{2.5}$ emissions for the three Throat Area Variations in 2040 without mitigation are estimated to be 0.77 tpy. When compared to the $PM_{2.5}$ emissions for the 2040 Build with Mitigation of 0.76 tpy, the $PM_{2.5}$ emissions for the 2040 Build with Mitigation decrease by 1.3%.

Table 7.10-2: 2040 Build Alternative with Mitigation (All Three Throat Area Variations) VOC and $PM_{2.5}$ Emissions Summary

Alternative	Mesoscale Moving Emissions	Mesoscale Idling Emissions	Locomotive Emissions	Total $PM_{2.5}$ Emissions
VOC				
2040 Build	2.37	1.13	0.68	**4.18**
2040 Build with Mitigation	2.35	1.12	0.67	**4.14**
Percent Change	**-0.8%**	**-0.9%**	**-1.5%**	**-1.0%**
$PM_{2.5}$				
2040 Build	0.43	0.20	0.14	**0.77**
2040 Build with Mitigation	0.43	0.19	0.14	**0.76**
Percent Change	**0.0%**	**-5.0%**	**0.0%**	**-1.3%**

tons/year

The results of the CO_2 and $PM_{2.5}$ hot spot analyses and NO_2 air dispersion modeling analysis demonstrate that the Project will not create a new violation of the NAAQS, will not increase in the frequency or severity of any existing violations, and will not delay the attainment of any NAAQS. Thus, no mitigation is required.

Construction Mitigation

Construction and demolition activities may generate fugitive dust, which may result in a localized increase of airborne particle levels. Fugitive dust emissions from construction activities will depend on such factors as the properties of the emitting surface, (e.g. moisture content), meteorological variables, and construction practices employed. The contractor will need to prepare an emissions control plan to address the areas of fugitive dust, construction equipment and vehicle exhaust, and potential traffic disruption and congestion. To reduce the emission of fugitive dust and minimize impacts on the local environment, the construction contractor will adhere to a number of mandatory best management measures outlined in the SWPPP. These measures will include:

- Using wetting agents to control and suppress dust from construction debris;
- Ensuring that all trucks traveling to and from the Project Site will be fully covered;
- Monitoring construction practices closely to ensure any emissions of dust are negligible;
- Cleaning streets and sidewalks to minimize dust and dirt accumulation;
- Monitoring construction activities by the job site superintendent and safety officer; and
- Wheel-washing trucks prior to exiting the Project Site during the excavation phase, if necessary.

Construction BMP/Dust Suppression

MassDOT's contractors must comply with the Massachusetts Department of Environmental Protection's (MassDEP's) Diesel Retrofit Program (MDRP). MDRP is a means to control emissions from construction equipment by promoting the use of engine emission controls, such as oxidation catalysts or particulate filters for diesel engines, to the maximum extent practicable. Additionally, compliance with the State's Low Sulfur Diesel standards (301 CMR 7.05) must be met. Furthermore, all construction equipment will be required to comply with 310 CMR 7.11 (1) (b), which requires that engines idle for no more than five minutes.

In addition to the MDRP mitigation, all equipment and vehicles will be kept properly maintained and repaired to minimize exhaust emissions, including odors. As part of the emissions control plan, the Contractor will also establish and maintain records of the routine maintenance programs for internal combustion engine-powered vehicles and equipment used for the Project. Proper maintenance and repair will minimize potential odor impacts due to diesel exhaust from construction equipment and trucks. Gasoline-fueled vehicles and equipment generally do not generate significant odor impacts when properly operated and maintained.

7.11 Noise and Vibration

7.11.1 I-90 Urban Interchange Preferred Alternative

For the I-90 Urban Interchange Preferred Alternative, Design Year noise levels will exceed the MassDOT Noise Abatement Criteria (NAC). There will also be Federal Transit Administration (FTA) moderate noise impact at residences near the existing Worcester Main Line in the Allston Village and Pratt Street/Wadsworth Street area. A 1,400-foot-long and 18-foot-tall noise wall along the rail right-of-way (ROW) between the proposed West Station and Cambridge Street will be feasible and reasonable according to MassDOT Noise Policy and will be considered likely to be required. As part of the process to determine the reasonableness of the wall, the viewpoints of benefited receptors will be solicited to determine their interests in constructing the noise wall.

Typical Noise Wall

In the Cambridge Street area, noise levels will exceed the NAC at first-row receptors on Cambridge Street and Mansfield Street. Noise mitigation, such as traffic management measures, traffic control devices, alteration of the horizontal or vertical alignment, or construction of noise barriers, were evaluated. Noise barriers will not be feasible on Cambridge Street due to access (i.e. driveway and curb cut) conflicts. The proposed design of Cambridge Street will include elements to help improve noise, such as slowing traffic speeds and shifting travel lanes away from receptors to provide wider sidewalks for pedestrian and bike access. Therefore, noise abatement measures will not be feasible and reasonable in this area.

West of the physical limits of the Project, two potential Type II noise walls on the westbound (north) side of I-90 along Lincoln Street, between Cambridge Street and Everett Street, and between Everett Street and Market Street were evaluated. These noise walls have been on the MassDOT Type II priority list since 1992 and were included in the noise study to evaluate the feasibility and reasonableness of mitigation. This analysis determined that both Type II noise walls will be needed, feasible and reasonable according to MassDOT Noise Policy. The wall between Cambridge Street and Everett Street will be 1,200-feet-long and 20-feet-tall and the wall between Everett Street and Market Street will be 1,700-feet-long and 18-feet-tall. As part of the process to determine the reasonableness of the walls, the viewpoints of benefited receptors will be solicited to determine their interests.

For future mixed-use development (by others), noise-sensitive receptors are only assessed for potential impact and only eligible for noise abatement if they have been permitted prior to the approval date of the environmental documentation. Therefore, future Design Year loudest-hour noise levels have been evaluated at representative locations in this area for informational purposes only. Design Year noise levels will be 62 to 72 dBA (Leq) which is typical of urban areas. It would be reasonable to expect that building developers could design their buildings to be compatible with the noise environment and provide acceptable exterior and interior noise conditions.

7.11.2 3K-HV and 3K-AMP Throat Area Variations

In the BU area, Design Year noise levels will exceed the exterior NAC at Nickerson Field and dormitories at 10 Buick Street for the 3K-HV and 3K-AMP Variations. There will be FTA severe noise impact at the College of Fine Arts, College of General Studies and 10 Buick Street. Noise impact at the school buildings will be due primarily to the introduction of new track turnouts on the Worcester Main Line that would increase noise levels. There will also be vibration and ground-borne noise impact at the concert hall within the College of Fine Arts due to the new track turnouts.

To mitigate noise impact at the College of Fine Arts, College of General Studies and 10 Buick Street for the 3K-HV and 3K-AMP Variations, it would be most effective to reduce noise associated with the new track turnout. Relocating the track turnout away from sensitive receptors, or using a specific turnout design to close the gap in the rail running surface and minimize noise and vibration, would mitigate potential impact. These turnouts, which include movable or spring-loaded parts, will be effective in reducing noise below the NAC. These turnouts will also be effective at mitigating potential vibration and ground-borne noise impact at the concert hall.

A potential noise wall to reduce noise below the NAC at 10 Buick Street was evaluated and found to not be acoustically effective due to the presence of an existing solid wood wall.

To mitigate noise impact at Nickerson Field, a 650-foot-long and 12-foot-tall noise wall on top of the existing retaining wall between Nickerson Field and the rail corridor will be feasible and reasonable to protect Nickerson Field from potential noise impact. Additionally for the 3K-HV Variation, a 650-foot-long and 8-foot-tall noise wall extending the height of the 3.5-foot parapet wall on the edge of the highway viaduct will be feasible and reasonable to protect Nickerson Field. As part of the process to determine the reasonableness of the walls, the viewpoints of BU officials will be solicited to determine their interests.

For the 3K-AMP Variation, Design Year noise levels will exceed the NAC on the PDW Path, at first-row receptors on Memorial Drive, and at portions of Magazine Beach. Noise abatement including noise walls were evaluated and found to not be feasible and reasonable according to MassDOT Noise Policy due to engineering feasibility and cost effectiveness.

7.11.3 3K-ABC Variation

In the BU area, Design Year noise levels will exceed the exterior NAC at Nickerson Field and dormitories at 10 Buick Street for the 3K-ABC Variation. There will also be FTA severe noise impact at the College of Fine Arts, College of General Studies, 10 Buick Street, 33 Agganis Way and Nickerson Field. Noise impact at the school buildings will be due primarily to the introduction of new track turnouts on the Worcester Main Line that will increase noise levels and the loss of acoustic shielding provided by the highway viaduct. Noise impact at Nickerson Field will be due primarily to the loss of acoustic shielding provided by the highway viaduct.

To mitigate noise impact at the College of Fine Arts, College of General Studies and 10 Buick Street for the 3K-ABC Varation, it will be most effective to reduce noise associated with the new track turnout. This can be achieved by relocating the track turnout away from sensitive receptors or using a specific turnout design to reduce noise. A potential noise wall to reduce noise below the NAC at 10 Buick Street was evaluated and found to not be acoustically effective due to the presence of an existing solid wood wall.

Since the school buildings and the dormitory at 33 Agganis Way do not have outdoor areas of frequent human use, such as balconies, noise levels (Leq) have been evaluated according to the interior MassDOT NAC (52 dBA). Based on the construction materials and the type of windows, the buildings are assumed to reduce interior noise levels by 35 decibels. Table 7.11-1 provides a Summary of Noise and Vibration Impact and Mitigation.

A 650-foot-long and 12-foot-tall noise wall on top of the existing retaining wall between Nickerson Field and the rail corridor will be feasible and reasonable to protect Nickerson Field from potential noise impact. As part of the process to determine the reasonableness of the walls, the viewpoints of BU officials will be solicited to determine their interests.

On the PDW Path, portions of Magazine Beach near the Charles River and at first-row receptors on Memorial Drive, Design Year noise levels will exceed the NAC. Noise abatement, including noise walls, were evaluated and found to not be feasible and reasonable according to MassDOT Noise Policy due to engineering feasibility and cost effectiveness.

Table 7.11-1: Summary of Noise and Vibration Impact and Mitigation

Area	Project Variation	Noise and Vibration Impact Assessment Results	Mitigation
Allston Village & Pratt Street/ Wadsworth Street Area	All	Noise impact at residences on Pratt Street and Wadsworth Street. No vibration impact since future vibration conditions will not be affected by the Project and number of trains will not double.	A 1,400-foot-long, 18-foot-tall noise wall will be feasible and reasonable. Vibration mitigation is not warranted.
Cambridge Street	All	Noise impact at first-row receptors on Cambridge Street and Mansfield Street.	A noise barrier will not be feasible and reasonable. Noise abatement through traffic control measures are included in proposed roadway design.
Lincoln Street	All	Existing noise levels exceed the MassDOT NAC.	Type II noise walls will be needed, feasible and reasonable. A noise wall between Cambridge Street and Everett Street will be 1,200-feet-long and 20-feet-tall. Noise wall between Everett Street and Market Street will be 1,700-feet-long and 18-feet-tall.
BPY	All	Design Year noise levels will range from 62 to 72 dBA (Leq).	Area is not eligible for abatement according to FHWA regulations and MassDOT Noise Policy.
Boston University Area	3K-HV	Noise levels will exceed the NAC at Nickerson Field, College of Fine Arts (interior) and 10 Buick Street (exterior). There will be FTA severe noise impact at College of Fine Arts, College of General Studies and 10 Buick Street.	Relocating or using a special track turnout to reduce noise will be effective at mitigating noise impact at College of Fine Arts. These track turnouts will also be effective at mitigating potential vibration and ground-borne noise impact at the concert hall within the College of Fine Arts. A noise wall will not be acoustically effective for 10 Buick Street due to the presence of an existing solid wood wall. Two noise walls, 650-feet-long, including a 12-foot-tall noise wall on top of the existing retaining wall, and an 8-foot-tall noise wall on top of the I-90 viaduct will be feasible and reasonable to protect potential noise impact at Nickerson Field.
	3K-AMP	Noise levels will exceed the NAC at Nickerson Field and 10 Buick Street (exterior). There will be FTA severe noise impact at College of Fine Arts, College of General Studies and 10 Buick Street.	Relocating or using a special track turnout to reduce noise will be effective at mitigating noise impact at the College of Fine Arts, College of General Studies and 10 Buick Street. These track turnouts will also be effective at mitigating potential vibration and ground-borne noise impact at the concert hall within the College of Fine Arts for Variation 3K-AMP. A noise wall will not be acoustically effective for 10 Buick Street due to the presence of an existing solid wood wall. A 650-foot-long and 12-foot-tall noise wall on top of the existing retaining wall will be feasible and reasonable to protect potential noise impact at Nickerson Field.
	3K-ABC	Noise levels will exceed the NAC at Nickerson Field and 10 Buick Street (exterior). There will be FTA severe noise impact at College of Fine Arts, College of General Studies, 10 Buick Street, 33 Agganis Way and Nickerson Field. There will be vibration and ground-borne noise impact at the concert hall in the College of Fine Arts due to the new track turnouts.	
PDW Path and Cambridge Area	3K-HV	Design Year noise levels will exceed the NAC on the PDW Path and first-row receptors next to Memorial Drive in the Riverside neighborhood of Cambridge. There would be no FTA noise impact.	Noise abatement will not be feasible and reasonable due to engineering constraints and cost effectiveness.
	3K-AMP	Design Year noise levels will exceed the NAC on the PDW Path, portions of Magazine Beach near the Charles River and first-row receptors next to Memorial Drive in Riverside Cambridge. There will be FTA moderate noise impact at receptors on the PDW Path.	
	3K-ABC		

7.12 Wetlands and Waterways

7.12.1 Wetlands

No Build

The conditions of the wetland resource areas within and adjacent to the Project Area will remain as they currently exist in the No Build Alternative. The viaduct will be rehabilitated in place. As portions of the viaduct are located within the 100-foot Buffer Zone of the Bank of the Charles River, this work will require an Order of Conditions from the Boston Conservation Commission under the Massachusetts Wetlands Protection Act (MA WPA). No in-water work is anticipated for the No Build Alternative, and there will be no direct alterations to state or federal wetland resource areas.

Mitigation measures for the No Build Alternative will include standard construction-period erosion prevention and sedimentation controls including the use of BMPs to protect the river by implementing a SWPPP as previously discussed in Section 7.1.

I-90 Urban Interchange Preferred Alternative

With the exception of the stormwater discharge pipes associated with the stormwater management component of the Project, the Project elements associated with the I-90 Urban Interchange Preferred Alternative will not be located within a wetland resource area subject to protection under the MA WPA. Moreover, no Project elements will be located within federal Waters of the U.S. subject to jurisdiction under the Clean Water Act.

The installation of new discharge pipes and the removal and replacement of some existing discharge pipes along the Charles River within the Project Area will temporarily and permanently alter Bank and Land Under Water (LUW). The alteration associated with the discharge pipes qualifies as a limited project under the MA WPA. The impacts would also be considered de minimis water dependent activities and therefore mitigation measures will be limited to standard construction-period erosion prevention and sedimentation controls, as described in Section 7.1.

3K-HV and 3K-AMP Variations

The 3K-HV and 3K-AMP Variations will not alter state or federal wetland resource areas within or along the Charles River. Mitigation measures for the 3K-HV and 3K-AMP Variations for work within the 100-foot Buffer Zone will include the standard construction-period erosion prevention and sedimentation controls described in Section 7.1.

3K-ABC Variation

The PDW portion of the 3K-ABC Variation will extend into the Charles River. The portion of the 3K-ABC layout riverward of elevation 4 will be supported by a retaining wall and associated fill, and result in the direct alteration of LUW, Bank, Bank Underlying an Anadromous/Catadromous Fish Run, Bordering Land Subject to Flooding (BLSF) and Navigable Waters of the U.S.

Mitigation for unavoidable alterations must be developed in accordance with state and federal requirements for alterations to LUW and Bank. The type, location and extent of mitigation will be determined through the Notice of Intent filing with the Boston Conservation Commission.

Mitigation in the form of time-of-year restrictions may be imposed during construction of the retaining wall to avoid seasonal migration, spawning and impacts to young fish to avoid nursery habitat impacts. Construction techniques that minimize sedimentation, turbidity and noise impacts should be provided to mitigate potential impacts to fisheries, based on coordination with the Massachusetts Division of Marine Fisheries.

7.12.2 Waterways

I-90 Urban Interchange Preferred Alternative and Throat Area Variations

Construction of the I-90 Urban Interchange Preferred Alternative and all Throat Area Variations will result in impacts to filled and flowed tidelands. All of the variations involve a change in use or conversion of tidelands from roadway to new public open space. The new public open space will be a waterfront park, created by shifting SFR away from the Charles River; the creation of the park is considered a water-dependent use and a benefit to the public. The newly created public parkland within Chapter 91 Jurisdiction under the 3K-HV Variation will be 2.26 acres, 2.34 acres under the 3K-AMP Variation and 1.58 acres under the 3K-ABC Variation. All of the created open space parkland represents a net increase in parkland within Chapter 91 Jurisdiction and excludes existing public parkland in the Project Area.

7.13 Floodplains

7.13.1 No Build

The conditions of the 100-year floodplain in the Project Area will remain as they currently exist in the No Build Alternative. There will be no short-term upgrades or maintenance activities expected to occur within the 100-year floodplain under the No Build Alternative; therefore no floodplain mitigation measures are proposed.

7.13.2 I-90 Urban Interchange Preferred Alternative and Throat Area Variations

Project elements associated with the I-90 Urban Interchange Preferred Alternative and the 3K-HV and 3K-AMP Variations will not be located within the 100-year floodplain. The Preferred Alternative will require minor stormwater discharge pipe work within the flood zone, however, it will not permanently displace flood storage, therefore, no floodplain mitigation will be required.

For the 3K-ABC Variation, portions of PDW Path will be supported by a retaining wall and associated fill between elevations 2 and 4, resulting in the loss of flood storage volume or flood storage capacity. In accordance with the MA WPA, compensation for loss of flood storage must be a volume not previously used for flood storage and incrementally equal to the volume of flood water at each elevation. The volume must have an unrestricted hydraulic connection to the same waterway and must be within the same reach of the river. The type, location and extent of mitigation will be determined through the Notice of Intent filing with the Boston Conservation Commission.

7.14 Navigation

7.14.1 No Build

Navigation conditions in the Charles River would remain as they currently exist in the No Build Alternative, since rehabilitation activities will not occur within the Charles River under the No Build Alternative. No navigation mitigation measures are proposed.

7.14.2 I-90 Urban Interchange Preferred Alternative and Throat Area Variations

The Project elements associated with the I-90 Urban Interchange Preferred Alternative, including rail operations and West Station, and the 3K-HV and 3K-AMP Variations, will not be located within the navigable waterway. There will be no impacts to navigation associated with the I-90 Urban Interchange portion of the Project or the 3K-HV or 3K-AMP Variations. No navigation mitigation measures are proposed.

The 3K-ABC Variation will be located within the navigable waterway below elevation 2. The introduction of the wall below elevation 2 is not expected to interfere with navigation in the waterway. The construction of the retaining wall and associated fill may be performed from the waterway by in-water barge and associated equipment requiring temporary occupation of portions of the navigable waterway.

The construction technique will be determined by the final design, however, the Project specifications may include provisions that the contractor must follow to ensure that navigation in the vicinity of the Project will be maintained, except for those circumstances where limited closures may occur for public safety purposes.

If the contractor elects to construct the wall from the water side, they will be required to prepare a navigation plan for review and approval by the DCR, United States Army Corps of Engineers (USACE), harbormasters, boating community and other marine interests. The plan will address methods to minimize impacts to all mariners, management of vessel traffic and overall safety issues.

7.15 Fisheries

7.15.1 No Build

Under the No Build Alternative, the viaduct will be rehabilitated in place. Conditions of the Charles River fisheries resources in proximity to the Project Area would remain as they currently exist in the No Build Alternative, therefore, no fisheries mitigation is proposed.

7.15.2 I-90 Urban Interchange Preferred Alternative and Throat Area Variations 3K-HV and 3K-AMP

The Project elements associated with the I-90 Urban Interchange Preferred Alternative, including rail operations and West Station, and the 3K-HV and 3K-AMP Variations, will not be located within the navigable waterway. No work will occur within the Charles River. There will be no impacts to fisheries resources; therefore, no fisheries mitigation is proposed.

3K-ABC Variation

The 3K-ABC Variation will include in-water work. The proposed improvements will extend into the Charles River. Temporary impacts associated with the construction of the section of the PDW Path within the Charles River may result from operation of equipment during construction. There could be barges, falsework, work platforms, staging, and/or cofferdams placed or constructed in the waterway in conjunction with building the structure. Fish habitat may be temporarily impacted by loud noises. In addition, certain construction equipment and/or techniques may cause fish to avoid migrating through the area, preventing access to spawning or feeding grounds.

A time of year restriction, depending on the specific species, may be imposed during construction to avoid seasonal migration, spawning, and impacts to young fish to avoid nursery habitat impacts. Construction techniques, which minimize sedimentation, turbidity and noise impacts will be provided to mitigate potential impacts to fisheries resources in the river.

7.16 Threatened and Endangered Species/Wildlife

7.16.1 No Build

Under the No Build Alternative, the viaduct would be rehabilitated extensively. The No Build Alternative will have minimal impact on wildlife resources and no impact on threatened and endangered species in the Project Area. Due to existing highway and rail operations, the Project Area is highly disturbed and the incremental addition of new disturbance sources would unlikely affect resident wildlife. No mitigation for threatened and endangered species is proposed.

7.16.2 I-90 Urban Interchange Preferred Alternative and Throat Area Variations

The Project Area is highly disturbed due to highway and rail operations and provides little and/or no wildlife habitat. As such, impacts to common wildlife from the I-90 Urban Interchange Preferred Alternative, rail operations and Throat Area Variations will be minimal and will have no impact on threatened and endangered species, as no threatened and endangered species are known to be present in the Project Area. No mitigation for threatened and endangered species is proposed.

Temporary impacts to common wildlife from the I-90 Urban Interchange Preferred Alternative and the three Throat Area Variations will consist of increased levels of disturbance caused by increased noise and activity within the Project Area from Project construction.

7.17 Stormwater Management

The Project will result in a total land disturbance to greater than one acre of land and discharges to a Water of the U.S. (Charles River) and therefore requires the preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the U.S. EPA's 2017 National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges from Construction Activities. The Construction General Permit (CGP) authorizes discharge from construction activities.

Construction practice: catch basin inlet protection

A SWPPP will be prepared describing the specific practices, installation methods and inspection requirements for temporary and permanent erosion and pollution prevention and sediment control practices. The minimum practices that will be included in the SWPPP, will include, but not limited to, the following:

- Installation of sediment controls along the top of the bank of the Charles River, such as silt fence and/or compost filter tubes;
- Stabilized construction exits to prevent sediment tracking from the work area onto public ways;
- Site specific construction phasing plans in order to minimize the extent of the disturbance at any one time;
- Catch basin inlet protection including geotextile filter fabric;
- Soil stockpile protection including temporary erosion measures and perimeter controls;
- Dust suppression including watering;
- Good housekeeping pollution prevention measures, including secondary containment;
- Maintenance requirements;
- Temporary and permanent stabilization requirements; and
- Record keeping/inspection requirements.

A copy of the SWPPP will be provided to the Boston Conservation Commission in conjunction with the requirements of Stormwater Management Standard 8. The SWPPP will be implemented by the Project contractor. A kick-off meeting will held by the stormwater team including the SWPPP preparer and the contractor to review the SWPPP and conditions required by the CGP.

Construction practice: erosion prevention by hydroseeding

7.18 Utilities

7.18.1 No Build

The replace-in-kind structural work on the I-90 viaduct for the No Build Alternative will involve enlargement of the existing foundations for the structure to be compliant with current seismic load requirements. However, the foundation work will result in only minor impacts, if any, to existing subsurface utilities.

The existing communication duct bank that will be suspended under the superstructure will require relocation. The construction staging required to reconstruct the deteriorated superstructure while maintaining traffic will be conducive to a relocation that replicates the existing condition. Construction staging associated with this type of utility relocation will involve at least one, and potentially more, temporary relocations of the communication conduits. Multiple temporary relocations are cumbersome to execute and expensive to construct. The most practicable, least expensive and least disruptive means of maintaining communication services without impeding the replacement of the viaduct superstructure will be to relocate the conduits in a single work stage to an underground alignment prior to superstructure work on the viaduct.

In coordination with Level 3, the owner of the conduit system, and the affected communication utilities, an underground alignment is preferred. Proceeding westerly, the underground relocation will begin on an alignment parallel to the viaduct on its northerly side, then cross under the viaduct before reaching the westerly abutment, continuing to the north of the Worcester Line track alignment parallel to Track 5. The underground relocation will include installation of three 8-inch diameter high-density polyethylene (HDPE) pipes buried below the frost line that will carry individual 1.5 inch diameter plastic conduits inside. Where the pipes cross under tracks, they will be either thick-walled HDPE or other material specified by the MBTA. Communication cables will be pulled within the 1.5-inch inner conduits by the affected utilities.

At the westerly end of BPY, at the Cambridge Street bridge over I-90, the installation will rise, attached to an existing bridge column, and cross I-90 within one of several available utility bays between the existing steel bridge girders. In a manner similar to the installation on the southerly bridge column, installation on the northerly side of the bridge will descend to an underground alignment and reconnect with the existing communications installation in the vicinity of the pedestrian bridge that crosses I-90. A few manholes will be required along the route to assist the utilities with the cable pulling work. All conduits, regardless of ownership of the cables inside them, will run through only Level 3 manholes along the relocation route due to space limitations.

7.18.2 I-90 Urban Interchange Preferred Alternative

Existing utilities to remain within the limits of the reconstructed interchange (not including Cambridge Street), include large stormwater or sanitary sewer pipe systems dependent on gravity operation. The existing sanitary sewers will not be directly impacted by construction of the street grid, the SFR depressed section or the interchange. Proposed subsurface installations, specifically the deeper foundations for traffic signals, will be established in locations that avoid impacts to the existing pipes.

Most of MassDOT's existing drainage system must be abandoned or removed because the locations of proposed re-aligned I-90 and the proposed street system will be constructed. In addition, the proposed depressed roadway section of SFR will impact the existing MassDOT drainage outfall to the Charles River so a new outfall will be constructed to the south of the depressed section.

The existing I-90 highway lighting system and the power that energizes the system will be impacted by the interchange reconstruction. Provisions will be made in the proposed construction contract to ensure that temporary highway lighting will be maintained throughout construction.

Within Cambridge Street, construction will not impact the existing utility infrastructure; however, the proposed drainage system, traffic signal system and landscaping may result in some localized impacts. At these locations, conflicts between the existing infrastructure and proposed facilities will be mitigated to the most practicable extent by first adjusting the design. If impacts still cannot be avoided, then a localized relocation of the utility will be implemented.

Utility work will require close coordination with all utility owners. Design plans will be provided to each owner for review, and mitigation measures will be determined based on the specific utility requirements and associated Project impacts.

7.18.3 Throat Area Variations

3K-HV Variation

In addition to the utility relocations described under the No Build Alternative, the 3K-HV Variation will also involve construction of new viaduct foundations to the north of the existing viaduct. An existing 58-inch by 63-inch MWRA sanitary sewer line is located in line with the proposed foundations, and as a result, the foundations will be designed to span over the sewer.

Replacement of the existing 6-inch water main under the viaduct will likely be needed on a new alignment as a result of 3K-HV foundation construction. The water main services fire hydrants and MassDOT's pump station No. 2.

3K-AMP Variation

The same utility relocations described under the No Build Alternative apply to the 3K-AMP Variation. In addition, the 6-inch water main relocation described under the 3K-HV Variation will also be required with this variation. Also required are stormwater pipe system relocation, relocation and reconstruction of pump station No. 2; additional stormwater system pumping; and relocation and reconstruction of existing connecting stormwater mains to the reconstructed pump station No. 2, as previously described.

The depression of I-90 below existing ground will be required for the GJR structure to maintain vertical clearance over the eastbound lanes of I-90. This lowering of the roadway elevation by approximately 8 feet will impact MWRA's encased 60-inch water main, which as a consequence will need to be reconstructed at a lower elevation under the proposed I-90 section and Worcester Main Line railroad tracks. To prevent groundwater from entering the depressed I-90 section, and also to counteract groundwater buoyancy, the proposed concrete slab under I-90 will be several feet thick, and as a result, the depth of bury for the reconstructed 60-inch main will need to be even lower. In order to maintain rail service while this deep installation is constructed, an excavation support structure will be built to prevent collapse of the trench. Temporary relocation of track will be required to maintain rail service. Temporary lane closures and/or temporary pavement widening of SFR will also be required. In addition, a separate alignment of the new main parallel to the existing main will be needed to minimize disruption of water main service.

The MWRA sanitary sewer main, varying in size from 58-inch by 63-inch to 60-inch diameter, will not require relocation or reconstruction. By building an interstate highway over it, manhole castings in travel lanes will introduce both interstate travel safety hazards and sewer access/maintenance impacts that will not be present with the 3K-HV Variation. The existing manhole castings will be removed and replaced with bolt-down covers. Where feasible, existing tops of manholes will be removed and offset cones will be constructed in their place to locate the manhole access points in shoulders or towards the center of travel lanes. This will minimize the number of lane closures needed for sewer maintenance access.

3K-ABC Variation

The same utility relocations described under the No Build Alternative will apply to the 3K-ABC Variation. In addition, the 6-inch water main relocation described under the 3K-HV Variation will also be required. The stormwater system impacts and mitigation will be similar to Variation 3K-AMP because 3K-ABC also involves construction of a depressed interstate section, but the concrete slab detail needed to prevent ground water intrusion will be required for only a few hundred feet. Stormwater system pumping requirements will be less than the 3K-AMP Variation. The depths of excavation for highway and rail under Variation 3K-ABC will not be as great as in 3K-AMP. Consequently, the relocation of the 60-inch encased MWRA water main will not be required. Impacts and mitigation requirements related to the MWRA sewer main will be the same as the 3K-ABC Variation.

7.19 Climate Change

The vulnerability assessment concluded that there are no current or near-term future storm surge inundation impacts expected for the Project Area due to climate change; however, over the long-term, storm surge inundation is possible in the Project Area if and when the combined effects of increased river discharge coupled with sea level rise (SLR) and storm surge that flank and overtop the Charles River Dam. These potential impacts will not occur until sometime between 2050 and 2070.

While it is likely that resiliency adaptations and engineering upgrades may be implemented at the Charles River Dam, as well as at other flanking locations (e.g., Charlestown), to provide more regional storm surge and SLR protection, site-specific resilience building options should also be pursued to provide redundancy and protection if regional adaptations due not occur. Strategies for mitigating potential climate change impacts on proposed Project elements, and the Project Area in general, should be based on two general approaches: (1) designing Project elements and associated open space to block predicted flood pathways and prevent the inland propagation of potential future storm surge inundation; and (2) designing Project elements and associated open space to accommodate and redirect potential future storm surge inundation away from critical infrastructure and towards designed retention areas.

The Boston Harbor Flood Risk Model (BH-FRM) 2070 combined flood exceedance probability curve for the Charles River provides water surface elevations (WSE) that may be used as design elevations. The 2070 1% (100-year event) and 0.1% (1000-year event) water surface elevations are 6.3 ft NAVD88 and 11.1 ft NAVD88, respectively. Mitigation measures to protect against or accommodate storm surge inundation from the Charles River to these elevations will be protective of future climate change impacts (from SLR, storm surge and river discharge).

Only minor portions of the Project Area will be vulnerable to the 2070 1% WSE of 6.3 ft NAVD88, where smaller volumes of water flank the dam. A living shoreline solution, elevated berm, or floodproof barrier built above 6.3 ft NAVD88 in the open space containing the PDW Path will protect SFR (in the area west of the BU Bridge) from inundation during a 2070 1% event. These protective features, could be green, gray, or hybrid solutions along the bank of the Charles River and could be weaved creatively into the fabric of the shoreline.

Larger portions of the Project Area are vulnerable to the 2070 0.1% WSE of 11.1 ft NAVD88. In general, the Throat Area Variations are vulnerable to this level of inundation along segments of SFR, segments of I-90 along the Charles River, eastern segments of Cambridge Street, and northern segments of the East Drive Connector.

The extent of inundation under this scenario, both along the proposed roadways and within the Project Area, varies among the Throat Area Variations. While the potential inundation areas along SFR and I-90 are directly related to bank overtopping from the adjacent Charles River, the potential inundation areas along Cambridge Street and the East Drive Connector are also related to regional inundation pathways. Potential inundation in the northeastern portion of the Project Area may result from the Charles River overtopping its banks north of the Project Area (north of Cambridge Street as far as North Harvard Street) and flowing south to the Project Area, especially along SFR and the low-elevation pathway located where the existing the I-90 on/off ramps pass under Cambridge Street.

To protect against direct overtopping to the Project Area from the Charles River during the 2070 0.1% storm, Project elements would have to be designed to the 11.1 ft NAVD88 WSE. A combination of interventions, most importantly the integration of raised berms and/or flood barrier solutions into the open space along the Charles River, floodproof barriers (operable/deployable/adaptable) and the strategic use of elevated filled road design (rather than bridge structures), may be deployed to counteract this future inundation.

If similar measures are not feasible north of the Project Area to address the additional bank overtopping (and associated regional flood pathways back to the Project Area), the Project could incorporate design elements to prevent or accommodate regional inundation. Raising the eastern portion of Cambridge Street to 11.1 ft NAVD88 would effectively block water from the north and prevent inundation of the Project Area in and around the East Drive Connector. In this case, special attention would need to be given to the preferential flood pathway along SFR from North Harvard Street south through the Project Area. If SFR inundation could not be prevented north of the Project Area, it would need to be either diverted to a retention area or pumped from the bottom of the SFR underpass. If it was also infeasible (or undesirable) to raise Cambridge Street, then some portion of the Project Area (likely some part of the area bounded by Cambridge Street, SFR, Cambridge Street South and the East Drive Connector) would need to be reserved and designed as a flood accommodation zone.

7.20 Oil and Hazardous Materials

As noted in Section 4.20, oil and hazardous materials (OHM) will generally be expected to be encountered at varying concentrations across much of the Project Area due to past commercial, industrial and transportation-related activities. All mitigation work on the Project, whether in rail or highway sections, will be conducted in accordance with the applicable regulatory framework, primarily the Massachusetts Contingency Plan (MCP). Subsequently, planning and implementation for all sections will be quite similar. For this reason, the mitigation discussion below applies to all sections of the I-90 Urban Interchange Preferred Alternative.

7.20.1 No Build

As noted in Section 5.20, there will be no significant effect under the No Build Alternative throughout the highway sections in the Project Area. However, due to current conditions, major rehabilitation of the viaduct will be required independent of the Project, and is therefore included as part of the No Build Alternative. Media (soil or groundwater) encountered during such potential earthwork will be managed in a manner similar to that of the primary highway work discussed below. The discussion below addresses mitigation relative to OHM encountered as part of No Build Alternative or viaduct rehabilitation.

7.20.2 I-90 Urban Interchange Preferred Alternative

As noted in Section 5.21, there are 77 MCP disposal sites within the Project Area, in varying states of activity, and with varying chemicals of concern (COCs). Project planning will incorporate knowledge of known MCP-related site conditions with respect to soil and groundwater management, as well as worker and neighborhood health and safety during construction. Re-use of soil on site will be the preferred option for materials management. In some sections of the Project Area, site conditions were sufficiently characterized during previous investigations to inform management plans. Other areas may warrant pre-construction characterization depending on site history or project goals. In such cases, preliminary pre-construction soil and groundwater testing will be conducted to inform re-use options and health and safety planning.

Should potentially reportable conditions be observed, the results will be forwarded to the site owner for their use in evaluating their reporting obligations under the MCP. In cases where a contractor is responsible for a release of OHM, the contractor will be responsible for managing the release. In cases of non-construction-related newly discovered reportable conditions, the site owner, or other identified potentially responsible party (PRP), will be responsible for MCP response actions. However, to the extent practicable, such response actions may be coordinated with construction activities. In all cases, soil or groundwater with known OHM-impacts that will be encountered during construction will be managed in accordance with the then-current applicable state and federal regulations. The planning process will include development of mechanisms and protocols to manage OHM in accordance with MCP and related regulations and policies. These may include the following:

- Documentation regarding soil and groundwater quality for known MCP sites will be made known to contractors by reference in contract documents. This material will be intended to inform development of their Health and Safety Plans (HASPs), as well as materials management during construction.
- Depending on the location of select construction activities with respect to known MCP disposal sites, the appropriate MCP management plan will be identified, developed and submitted to the Mass DEP. Plans may include Release Abatement Measures (RAMs), Immediate Response Actions (IRAs), Utility Related Abatement Measures (URAMs), Phase IV Remedy Implementation Plans (Phase IV RIPs), or other as required under the MCP. All plans will require electronic submittal to DEP, along with periodic status reports and completion statements.
- In those areas with formal Activity and Use Limitations (AULs), constraints on soil and groundwater handling will be documented in the appropriate MCP mechanism noted above, and compliance with deed restrictions will be documented in status and closure reports.
- Informed by known MCP site conditions, media management planning will be documented in Soil Management Plans (SMPs), Excavated Materials Management Plans (EMMPs), or equivalent. Such plans are intended to provide guidance on materials handling and management, reporting and documentation requirements, and compliance with MCP requirements.
- Should impacted soil be generated during Project-related excavation that requires export or on-site re-use, this material will be properly characterized and managed in accordance with applicable regulations.
- Material used for backfill in utility trenches will be suitable from an exposure point concentration perspective for utility worker access in accordance with applicable sections of the MCP and related policies.
- Should OHM-impacted groundwater be encountered during Project construction, it will also be managed in accordance with applicable regulations. Depending on site constraints and on the nature and volume of the recovered groundwater, management options may include direct recharge to the ground if consistent with MCP requirements, treatment and discharge under either the U.S. EPA Construction General Permit (CGP) or Remediation General Permit (RGP), shipping off-site for treatment or disposal, or equivalent media management options.
- The spill or release of OHM in the process of constructing the Project will be an unlikely event, and measures would be required to prevent and control any such spills. The Contractor will implement a Spill Control Program in compliance with the MCP. The following practices would be employed on site to prevent, reduce and clean up spills:
    - All construction-related spills will be reported to MassDOT and will be reported to the appropriate state and/or federal agency if the reportable quantity is exceeded.
    - Spill cleanup materials will be kept in a chemical storage area.
    - All spills will be cleaned up immediately after discovery, to the extent practicable.
    - A spill report will be prepared after each occurrence.
    - An appropriately trained employee involved in day-to-day operations will be identified to be the spill prevention coordinator. Each employee will be instructed to report spills to the spill prevention coordinator.
    - An inventory of construction and maintenance materials, (and corresponding Safety Data Sheets), will be maintained.
- To the extent existing infrastructure will be demolished, handling and management of construction and demolition waste and hazardous building materials may be required. To remain compliant with applicable regulations, the following permits will be procured: MassDEP Demolition Notification (BWP-AQ-06), MassDEP Asbestos Notification Form (ANF-001), and City of Boston Demolition Permit. To inform demolition planning, the Project will perform pre-demolition building materials surveys, including asbestos surveys, lead based paint surveys and other regulated construction materials, if warranted.

7.21 DRAFT Section 61 Finding I-90 Preferred Urban Interchange Alternative and 3K-HV Throat Area Variation

Introduction

In accordance with M.G.L. c. 30, section 61, any state agency that takes Action on a project for which the Secretary requires an EIR shall determine whether a project is likely, directly or indirectly to cause damage to the environment and make a finding describing the damage to the environment and confirming that all feasible measures have been taken to avoid or minimize such damage.

Regulations found at 301 CMR 11.07 (6)(k) state "Proposed Section 61 Findings. Proposed findings in accordance with M.G.L. c. 30, section 61 for each Agency for each Agency Action to be taken on the Project. These Proposed Section 61 Findings shall specify in detail: all feasible measures to be taken by the Proponent or any other Agency or Person to avoid Damage to the Environment or, to the extent Damage to the Environment cannot be avoided, to minimize and mitigate Damage to the Environment to the maximum extent practicable; an Agency or Person responsible for funding and implementing mitigation measures, if not the Proponent; and the anticipated implementation schedule that will ensure that mitigation measures shall be implemented prior to or when appropriate in relation to environmental impacts."

This Section 61 finding, prepared by MassDOT, the Project proponent, will be used by each participating agency that will issue a state permit. The following Section 61 Findings summarize the Project's impacts and mitigation measures for the I-90 Allston Interchange Project for the Preferred I-90 Urban Interchange and Throat Area Variation 3K-HV.

Project Purpose

The following represents the Project Purpose.

Interchange

The purpose of the highway improvements is to replace the functionally obsolete, structurally deficient I-90 viaduct with a safer facility, and to reduce congestion and improve mobility in the surrounding area by providing a new interchange with a network of ramps and local street connections. The existing I-90 viaduct, the elevated section of highway that runs from approximately Commonwealth Avenue in the east to the former Allston toll plaza in the west, is deteriorating. It is structurally deficient and nearing the end of its useful service life.

Rail Operations

MassDOT has identified Beacon Park Yard (BPY) in Allston as its preferred location to meet the MBTA's current deficit of layover capacity to support its south side commuter rail operations as part of the South Station Expansion project. An integral component of South Station operations is the continued ability to access and use rail yards near South Station to store, service, inspect and conduct minor repair activities when trains are not in service. The rail operations improvements are to support the current and anticipated railroad service demands of the Massachusetts Bay Transportation Authority (MBTA) commuter rail system, and maintain and enhance operations along the Worcester Main Line and the Grand Junction Railroad (GJR).

West Station

The purpose of West Station is to provide a neighborhood-oriented, multi-modal commuter rail station in an area surrounded by higher education facilities and residences with transit hub connections for rail and bus riders, bicyclists and pedestrians.

Project Need

The following represents the Project Need.

- Safety: Ability to correct existing or potential safety hazards/accident rates
- Capacity: Ability of existing facility to meet present and projected demands
- System linkage: Ability to provide a "connecting link" and fit into the regional and local transportation system
- Transportation demand: Relationship to a statewide plan or adopted urban transportation plan
- Social demands or economic development benefits: Relationship to land use plans, recreation facilities, and economic development/land use changes that indicate the need to improve or add to the highway capacity
- Modal interrelationships: Ability to interface/complement airport, rail, port and mass transit facilities
- Roadway deficiencies: Ability to correct substandard geometrics, load limits, inadequate cross sections and high maintenance costs
- Rail operations: Ability to support MBTA commuter rail operations now and in the future
- West Station: Ability/need to maximize potential use of multiple public transportation services, compared to vehicular-only travel
- Complete construction of new track work that will expand train capacity on the Worcester Main Line, and implement signal and control upgrades that improve current and future operations for both the Worcester Main Line and the GJR
- Store commuter rail trains during the midday layover period to address an existing and growing deficiency in layover spaces on the MBTA's South Side system

Project Description

MassDOT proposes to replace the existing highway interchange with a new multi-modal urban interchange that meets the needs of motorists, pedestrians, bicyclists and mass transit (light and heavy commuter rail, bus and shuttle) users while accommodating potential future mixed-use development. The Project will replace the deteriorating I-90 viaduct, realign I-90 to accommodate recent improvements for All Electronic Tolling (AET), and improve safety and function. The Project will also improve transit opportunities by creating a new train station (West Station), providing pedestrian and bicycle infrastructure, and accommodating future development within the urban interchange street network. In addition, the Project will preserve for the MBTA much needed layover space within an area historically used for railroad purposes.

MEPA History

An Environmental Notification Form (ENF) for the Project was filed on October 31, 2014 and published in the Environmental Monitor on November 5, 2014, Executive Office of Energy and Environmental Affairs (EOEEA) File Number 15278. On December 24, 2014, the Secretary of the EOEEA issued a Certificate on the ENF (the Secretary's Certificate) requiring an Environmental Impact Report (EIR).

State Agency/Issuing Authority	Permit or Authorization
Secretary of Energy and Environmental Affairs	Public Benefit Review and Determination, 301 CMR 11.03.
Massachusetts State Legislature	Article 97 of the Amendments to the Massachusetts Constitution
Massachusetts Historical Commission	950 CMR 71.00
Massachusetts Department of Conservation and Recreation	350 CMR 2.00, Use of Reservations and Parkways-Construction and Access Permit
Massachusetts Department of Environmental Protection **Wetlands and Waterways Program**	Massachusetts Public Waterfront Act: M.G.L c. 91 and Regulations at 310 CMR 9.00-MassDEP Chapter 91 Waterways License
Massachusetts Water Resources Authority	8(m) Permit
Boston Conservation Commission /MA Department of Environmental Protection, Wetlands and Waterways Program (if appealed)	Wetlands Protection Act, M.G.L. c. 131, § 40 and Regulations at 310 CMR 10.00.
Massachusetts Department of Environmental Protection, Bureau of Air and Waste	Solid Waste Beneficial Use Determination, 310 CMR 19.00
Massachusetts Department of Environmental Protection, Bureau of Air and Waste	Solid Waste Site Assignment, 310 CMR 16.00
Massachusetts Department of Environmental Protection, Bureau of Air and Waste	Asbestos Notification/Removal, 310 CMR 7.15
Massachusetts Department of Environmental Protection, Bureau of Air and Waste	Demolition/Construction Notification, 310 CMR 7.09

Measures to Avoid and Minimize Impacts

All feasible and practicable means and measures were taken to avoid and minimize potential damage to the environment, while meeting the Project's Purpose and Need. The potential environmental impacts are described and quantified in the DEIR.

For those impacts that are unavoidable, MassDOT has developed the following mitigation measures associated with the construction and operation of the Project. The mitigation measures for unavoidable impacts are described and quantified in the DEIR. The mitigation measures will be updated and refined based on the final impacts presented to the various issuing authorities through the respective permit applications. The following table summarizes unavoidable impacts, mitigation commitments, responsible party, estimated cost and schedule for implementation.

Mitigation Summary Table I-90 Preferred Urban Interchange Alternative and 3K-HV Throat Area Variation

Environmental Impact	Mitigation Measure	Responsible Party	Estimated Cost	Estimated Schedule
Conversion of Article 97 Land	Creation of 3.59 acres of new open space	MassDOT	TBD	End of Construction
Effect on Historic Properties	TBD - FHWA/SHPO	MassDOT	TBD	Prior to start of construction
Traffic and Safety				
Construction Term	Maintenance of Traffic: • Temporary Traffic Control Measures to maintain safe passage of vehicles, pedestrians, bicyclists and transit operations.	MassDOT	TBD	Developed by Design/Build Contractor as part of means and methods
Operation Term	Traffic Monitoring Program: • Continuous traffic counting equipment on I-90 E/W on/off ramps & SFR on/off ramps. • Que detection equipment on I-90 E/W off ramps and SFR westbound off ramp to Cambridge Street South. • Real time traffic monitoring devices.	MassDOT	TBD	Installed upon completion of construction
Air Quality				
Construction Term	Best management practices to control fugitive dust: • Wetting agents for suppression; • Covered trucks; • Street sweeping; • Compliance with MA DEP Diesel Retrofit Program • Compliance with State's Low Sulfur Diesel standards • Compliance with engine idling restrictions	MassDOT	TBD	Duration of Construction
Operation Term	• Highway: Implementation of Transportation Demand Management (TDM) measures: vehicle trip reduction from West Station construction • Rail: Compliance with Tier 4 locomotive emission standards in 2040. Electric plug in heaters	MassDOT	TBD	Post-Construction
Greenhouse Gas	West Station energy efficient measures (EEM): • LED lighting; high efficiency elevators; solar ready bus depot canopy. • Lower light power density per Stretch Code • EEM Certification to EOEEA	MassDOT	TBD	Post-Construction
Noise and Vibration	Noise walls: • Allston Village & Pratt/Wadsworth Street Area • Lincoln Street: between Cambridge & Everett Streets and between Everett and Market Streets. • B.U. Area-Nickerson Field: atop existing retaining wall and atop I-90 viaduct	MassDOT	TBD	Construction

Mitigation Summary Table I-90 Preferred Urban Interchange Alternative and 3K-HV Throat Area Variation

Environmental Impact	Mitigation Measure	Responsible Party	Estimated Cost	Estimated Schedule
Wetlands				
Construction Term	Implementation of Stormwater Pollution Prevention Plan	MassDOT	TBD	Construction Duration
Operation Term	None required			
Waterways	Creation of 2.26 acres of net new public parkland within Ch. 91 jurisdiction	MassDOT	TBD	Construction
Navigation				
Construction Term	None required.			
Operation Term	None required.			
Fisheries				
Construction Term	None required.			
Operation Term	None required.			
Stormwater Management and Water Quality				
Operation Term	Designed in conformance with MA DEP Water Quality Standards; Maintenance according to Operations and Maintenance Plan Meets TMDL target for reduced phosphorous and pathogens	MassDOT	TBD	Perpetuity
Utilities				
Construction Term	Coordination with various utility owners to maintain operations	MassDOT	TBD	Prior to and during construction
Operation Term	Coordination with various utility owners for capacity and relocation plans	MassDOT	TBD	Prior to construction
Water Consumption	None required			
Wastewater Generation	None required			
Climate Change	Design: Explore blocking pathways to prevent inland surge and inundation; redirect storm surge inundation away from critical infrastructure towards retention areas if required	MassDOT	TBD	To be reevaluated in future to determine if increase in upstream discharges, SLR and storm surge overtopping of Charles River Dam; diversion or pumping of flood waters may be required
Oil and Hazardous Materials				
Construction Term	• Preconstruction characterization of areas to be disturbed; Management of Oil and Hazardous Materials encountered during construction will be managed based on Massachusetts Contingency Plan. • Media management: Soil Management Plans, Excavated Materials Management Plans. Remediation General Permit for discharge of OHM impacted groundwater. Implementation of Spill Control Program.	MassDOT	TBD	Construction Term

7.22 DRAFT Section 61 Finding I-90 Preferred Urban Interchange Alternative and 3K-AMP Throat Area Variation

Introduction

In accordance with M.G.L. c. 30, section 61, any state agency that takes Action on a project for which the Secretary requires an EIR shall determine whether a project is likely, directly or indirectly to cause damage to the environment and make a finding describing the damage to the environment and confirming that all feasible measures have been taken to avoid or minimize such damage.

Regulations found at 301 CMR 11.07 (6)(k) state "Proposed Section 61 Findings. Proposed findings in accordance with M.G.L. c. 30, section 61 for each Agency for each Agency Action to be taken on the Project. These Proposed Section 61 Findings shall specify in detail: all feasible measures to be taken by the Proponent or any other Agency or Person to avoid Damage to the Environment or, to the extent Damage to the Environment cannot be avoided, to minimize and mitigate Damage to the Environment to the maximum extent practicable; an Agency or Person responsible for funding and implementing mitigation measures, if not the Proponent; and the anticipated implementation schedule that will ensure that mitigation measures shall be implemented prior to or when appropriate in relation to environmental impacts."

This Section 61 finding, prepared by MassDOT, the Project proponent, will be used by each participating agency that will issue a state permit. The following Section 61 Findings summarize the Project's impacts and mitigation measures for the I-90 Allston Interchange Project for the Preferred I-90 Urban Interchange and Throat Area Variation 3K-AMP.

Project Purpose

The following represents the Project Purpose.

Interchange

The purpose of the highway improvements is to replace the functionally obsolete, structurally deficient I-90 viaduct with a safer facility, and to reduce congestion and improve mobility in the surrounding area by providing a new interchange with a network of ramps and local street connections. The existing I-90 viaduct, the elevated section of highway that runs from approximately Commonwealth Avenue in the east to the former Allston toll plaza in the west, is deteriorating. It is structurally deficient and nearing the end of its useful service life.

Rail Operations

MassDOT has identified Beacon Park Yard (BPY) in Allston as its preferred location to meet the MBTA's current deficit of layover capacity to support its south side commuter rail operations as part of the South Station Expansion project. An integral component of South Station operations is the continued ability to access and use rail yards near South Station to store, service, inspect and conduct minor repair activities when trains are not in service. The rail operations improvements are to support the current and anticipated railroad service demands of the Massachusetts Bay Transportation Authority (MBTA) commuter rail system, and maintain and enhance operations along the Worcester Main Line and the Grand Junction Railroad (GJR).

West Station

The purpose of West Station is to provide a neighborhood-oriented, multi-modal commuter rail station in an area surrounded by higher education facilities and residences with transit hub connections for rail and bus riders, bicyclists and pedestrians.

Project Need

The following represents the Project Need.

- Safety: Ability to correct existing or potential safety hazards/accident rates
- Capacity: Ability of existing facility to meet present and projected demands
- System linkage: Ability to provide a "connecting link" and fit into the regional and local transportation system
- Transportation demand: Relationship to a statewide plan or adopted urban transportation plan
- Social demands or economic development benefits: Relationship to land use plans, recreation facilities, and economic development/land use changes that indicate the need to improve or add to the highway capacity
- Modal interrelationships: Ability to interface/complement airport, rail, port and mass transit facilities
- Roadway deficiencies: Ability to correct substandard geometrics, load limits, inadequate cross sections and high maintenance costs
- Rail operations: Ability to support MBTA commuter rail operations now and in the future
- West Station: Ability/need to maximize potential use of multiple public transportation services, compared to vehicular-only travel
- Complete construction of new track work that will expand train capacity on the Worcester Main Line, and implement signal and control upgrades that improve current and future operations for both the Worcester Main Line and the GJR
- Store commuter rail trains during the midday layover period to address an existing and growing deficiency in layover spaces on the MBTA's South Side system

Project Description

MassDOT proposes to replace the existing highway interchange with a new multi-modal urban interchange that meets the needs of motorists, pedestrians, bicyclists and mass transit (light and heavy commuter rail, bus and shuttle) users while accommodating potential future mixed-use development. The Project will replace the deteriorating I-90 viaduct, realign I-90 to accommodate recent improvements for All Electronic Tolling (AET), and improve safety and function. The Project will also improve transit opportunities by creating a new train station (West Station), providing pedestrian and bicycle infrastructure, and accommodating future development within the urban interchange street network. In addition, the Project will preserve for the MBTA much needed layover space within an area historically used for railroad purposes.

MEPA History

An Environmental Notification Form (ENF) for the Project was filed on October 31, 2014 and published in the Environmental Monitor on November 5, 2014, Executive Office of Energy and Environmental Affairs (EOEEA) File Number 15278. On December 24, 2014, the Secretary of the EOEEA issued a Certificate on the ENF (the Secretary's Certificate) requiring an Environmental Impact Report (EIR).

State Agency/Issuing Authority	Permit or Authorization
Secretary of Energy and Environmental Affairs	Public Benefit Review and Determination, 301 CMR 11.03.
Massachusetts State Legislature	Article 97 of the Amendments to the Massachusetts Constitution
Massachusetts Historical Commission	950 CMR 71.00
Massachusetts Department of Conservation and Recreation	350 CMR 2.00, Use of Reservations and Parkways-Construction and Access Permit
Massachusetts Department of Environmental Protection **Wetlands and Waterways Program**	Massachusetts Public Waterfront Act: M.G.L c. 91 and Regulations at 310 CMR 9.00-MassDEP Chapter 91 Waterways License
Massachusetts Water Resources Authority	8(m) Permit
Boston Conservation Commission /MA Department of Environmental Protection, Wetlands and Waterways Program (if appealed)	Wetlands Protection Act, M.G.L. c. 131, § 40 and Regulations at 310 CMR 10.00.
Massachusetts Department of Environmental Protection, Bureau of Air and Waste	Solid Waste Beneficial Use Determination, 310 CMR 19.00
Massachusetts Department of Environmental Protection, Bureau of Air and Waste	Solid Waste Site Assignment, 310 CMR 16.00
Massachusetts Department of Environmental Protection, Bureau of Air and Waste	Asbestos Notification/Removal, 310 CMR 7.15
Massachusetts Department of Environmental Protection, Bureau of Air and Waste	Demolition/Construction Notification, 310 CMR 7.09

Measures to Avoid and Minimize Impacts

All feasible and practicable means and measures were taken to avoid and minimize potential damage to the environment, while meeting the Project's Purpose and Need. The potential environmental impacts are described and quantified in the DEIR.

For those impacts that are unavoidable, MassDOT has developed the following mitigation measures associated with the construction and operation of the Project. The mitigation measures for unavoidable impacts are described and quantified in the DEIR. The mitigation measures will be updated and refined based on the final impacts presented to the various issuing authorities through the respective permit applications. The following table summarizes unavoidable impacts, mitigation commitments, responsible party, estimated cost and schedule for implementation.

Mitigation Summary Table I-90 Preferred Urban Interchange Alternative and 3K-AMP Throat Area Variation

Environmental Impact	Mitigation Measure	Responsible Party	Estimated Cost	Estimated Schedule
Conversion of Article 97 Land	Creation of 3.53 acres of new open space	MassDOT	TBD	End of Construction
Effect on Historic Properties	TBD - FHWA/SHPO	MassDOT	TBD	Prior to start of construction
Traffic and Safety				
Construction Term	Maintenance of Traffic: • Temporary Traffic Control Measures to maintain safe passage of vehicles, pedestrians, bicyclists and transit operations.	MassDOT	TBD	Developed by Design/Build Contractor as part of means and methods
Operation Term	Traffic Monitoring Program: • Continuous traffic counting equipment on I-90 E/W on/off ramps & SFR on/off ramps. • Que detection equipment on I-90 E/W off ramps and SFR westbound off ramp to Cambridge Street South. • Real time traffic monitoring devices.	MassDOT	TBD	Installed upon completion of construction
Air Quality				
Construction Term	Best management practices to control fugitive dust: • Wetting agents for suppression; • Covered trucks; • Street sweeping; • Compliance with MA DEP Diesel Retrofit Program • Compliance with State's Low Sulfur Diesel standards • Compliance with engine idling restrictions	MassDOT	TBD	Duration of Construction
Operation Term	• Highway: Implementation of Transportation Demand Management (TDM) measures: vehicle trip reduction from West Station construction • Rail: Compliance with Tier 4 locomotive emission standards in 2040. Electric plug in heaters	MassDOT	TBD	Post-Construction
Greenhouse Gas	West Station energy efficient measures (EEM): • LED lighting; high efficiency elevators; solar ready bus depot canopy. • Lower light power density per Stretch Code • EEM Certification to EOEEA	MassDOT	TBD	Post-Construction
Noise and Vibration	Noise walls: • Allston Village & Pratt and Wadsworth Street Area • Lincoln Street: between Cambridge & Everett Streets and between Everett and Market Streets. • B.U. Area-Nickerson Field: atop existing retaining wall	MassDOT	TBD	Construction

Mitigation Summary Table I-90 Preferred Urban Interchange Alternative and 3K-AMP Throat Area Variation

Environmental Impact	Mitigation Measure	Responsible Party	Estimated Cost	Estimated Schedule
Wetlands				
Construction Term	Implementation of Stormwater Pollution Prevention Plan	MassDOT	TBD	Construction Duration
Operation Term	None required			
Waterways	Creation of 2.34 acres of net new public parkland within Ch. 91 jurisdiction	MassDOT	TBD	Construction
Navigation				
Construction Term	None required			
Operation Term	None required			
Fisheries				
Construction Term	None required			
Operation Term	None required			
Stormwater Management and Water Quality				
Operation Term	Designed in conformance with MA DEP Water Quality Standards; Maintenance according to Operations and Maintenance Plan Meets TMDL target for reduced phosphorous and pathogens	MassDOT	TBD	Perpetuity
Utilities				
Construction Term	Coordination with various utility owners to maintain operations	MassDOT	TBD	Prior to and during construction
Operation Term	Coordination with various utility owners for capacity and relocation plans	MassDOT	TBD	Prior to construction
Water Consumption	None required			
Wastewater Generation	None required			
Climate Change	Design: Explore blocking pathways to prevent inland surge and inundation; redirect storm surge inundation away from critical infrastructure towards retention areas if required	MassDOT	TBD	To be reevaluated in future to determine if increase in upstream discharges, SLR and storm surge overtopping of Charles River Dam; diversion or pumping of flood waters may be required
Oil and Hazardous Materials				
Construction Term	• Preconstruction characterization of areas to be disturbed; Management of Oil and Hazardous Materials encountered during construction will be managed based on Massachusetts Contingency Plan. • Media management: Soil Management Plans, Excavated Materials Management Plans. Remediation General Permit for discharge of OHM impacted groundwater. Implementation of Spill Control Program.	MassDOT	TBD	Construction Term

7.23 DRAFT Section 61 Finding I-90 Preferred Urban Interchange Alternative and 3K-ABC Throat Area Variation

Introduction

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Regulations found at 301 CMR 11.07 (6)(k) state "Proposed Section 61 Findings. Proposed findings in accordance with M.G.L. c. 30, section 61 for each Agency for each Agency Action to be taken on the Project. These Proposed Section 61 Findings shall specify in detail: all feasible measures to be taken by the Proponent or any other Agency or Person to avoid Damage to the Environment or, to the extent Damage to the Environment cannot be avoided, to minimize and mitigate Damage to the Environment to the maximum extent practicable; an Agency or Person responsible for funding and implementing mitigation measures, if not the Proponent; and the anticipated implementation schedule that will ensure that mitigation measures shall be implemented prior to or when appropriate in relation to environmental impacts."

This Section 61 finding, prepared by MassDOT, the Project proponent, will be used by each participating agency that will issue a state permit. The following Section 61 Findings summarize the Project's impacts and mitigation measures for the I-90 Allston Interchange Project for the Preferred I-90 Urban Interchange and Throat Area Variation 3K-ABC.

Project Purpose

The following represents the Project Purpose.

Interchange

The purpose of the highway improvements is to replace the functionally obsolete, structurally deficient I-90 viaduct with a safer facility, and to reduce congestion and improve mobility in the surrounding area by providing a new interchange with a network of ramps and local street connections. The existing I-90 viaduct, the elevated section of highway that runs from approximately Commonwealth Avenue in the east to the former Allston toll plaza in the west, is deteriorating. It is structurally deficient and nearing the end of its useful service life.

Rail Operations

MassDOT has identified Beacon Park Yard (BPY) in Allston as its preferred location to meet the MBTA's current deficit of layover capacity to support its south side commuter rail operations as part of the South Station Expansion project. An integral component of South Station operations is the continued ability to access and use rail yards near South Station to store, service, inspect and conduct minor repair activities when trains are not in service. The rail operations improvements are to support the current and anticipated railroad service demands of the Massachusetts Bay Transportation Authority (MBTA) commuter rail system, and maintain and enhance operations along the Worcester Main Line and the Grand Junction Railroad (GJR).

West Station

The purpose of West Station is to provide a neighborhood-oriented, multi-modal commuter rail station in an area surrounded by higher education facilities and residences with transit hub connections for rail and bus riders, bicyclists and pedestrians.

Project Need

The following represents the Project Need.

- Safety: Ability to correct existing or potential safety hazards/accident rates
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- System linkage: Ability to provide a "connecting link" and fit into the regional and local transportation system
- Transportation demand: Relationship to a statewide plan or adopted urban transportation plan
- Social demands or economic development benefits: Relationship to land use plans, recreation facilities, and economic development/land use changes that indicate the need to improve or add to the highway capacity
- Modal interrelationships: Ability to interface/complement airport, rail, port and mass transit facilities
- Roadway deficiencies: Ability to correct substandard geometrics, load limits, inadequate cross sections and high maintenance costs
- Rail operations: Ability to support MBTA commuter rail operations now and in the future
- West Station: Ability/need to maximize potential use of multiple public transportation services, compared to vehicular-only travel
- Complete construction of new track work that will expand train capacity on the Worcester Main Line, and implement signal and control upgrades that improve current and future operations for both the Worcester Main Line and the GJR
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Project Description

MassDOT proposes to replace the existing highway interchange with a new multi-modal urban interchange that meets the needs of motorists, pedestrians, bicyclists and mass transit (light and heavy commuter rail, bus and shuttle) users while accommodating potential future mixed-use development. The Project will replace the deteriorating I-90 viaduct, realign I-90 to accommodate recent improvements for All Electronic Tolling (AET), and improve safety and function. The Project will also improve transit opportunities by creating a new train station (West Station), providing pedestrian and bicycle infrastructure, and accommodating future development within the urban interchange street network. In addition, the Project will preserve for the MBTA much needed layover space within an area historically used for railroad purposes.

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Massachusetts Department of Environmental Protection	Water Quality Certification 314 CMR 9.00
Massachusetts Water Resources Authority	8(m) Permit
Boston Conservation Commission /MA Department of Environmental Protection, Wetlands and Waterways Program (if appealed)	Wetlands Protection Act, M.G.L. c. 131, § 40 and Regulations at 310 CMR 10.00.
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Measures to Avoid and Minimize Impacts

All feasible and practicable means and measures were taken to avoid and minimize potential damage to the environment, while meeting the Project's Purpose and Need. The potential environmental impacts are described and quantified in the DEIR.

For those impacts that are unavoidable, MassDOT has developed the following mitigation measures associated with the construction and operation of the Project. The mitigation measures for unavoidable impacts are described and quantified in the DEIR. The mitigation measures will be updated and refined based on the final impacts presented to the various issuing authorities through the respective permit applications. The following table summarizes unavoidable impacts, mitigation commitments, responsible party, estimated cost and schedule for implementation.

Mitigation Summary Table I-90 Preferred Urban Interchange Alternative and 3K-ABC Throat Area Variation

Environmental Impact	Mitigation Measure	Responsible Party	Estimated Cost	Estimated Schedule
Conversion of Article 97 Land	Creation of 3.22 acres of new open space	MassDOT	TBD	End of Construction
Effect on Historic Properties	TBD - FHWA/SHPO	MassDOT	TBD	Prior to start of construction
Traffic and Safety				
Construction Term	Maintenance of Traffic: • Temporary Traffic Control Measures to maintain safe passage of vehicles, pedestrians, bicyclists and transit operations.	MassDOT	TBD	Developed by Design/Build Contractor as part of means and methods
Operation Term	Traffic Monitoring Program: • Continuous traffic counting equipment on I-90 E/W on/off ramps & SFR on/off ramps. • Que detection equipment on I-90 E/W off ramps and SFR westbound off ramp to Cambridge Street South • Real time traffic monitoring devices	MassDOT	TBD	Installed upon completion of construction
Air Quality				
Construction Term	Best management practices to control fugitive dust: • Wetting agents for suppression; • Covered trucks; • Street sweeping; • Compliance with MA DEP Diesel Retrofit Program • Compliance with State's Low Sulfur Diesel standards • Compliance with engine idling restrictions	MassDOT	TBD	Duration of Construction
Operation Term	• Highway: Implementation of Transportation Demand Management (TDM) measures: vehicle trip reduction from West Station construction • Rail: Compliance with Tier 4 locomotive emission standards in 2040. Electric plug in heaters	MassDOT	TBD	Post-Construction
Greenhouse Gas	West Station energy efficient measures (EEM): • LED lighting; high efficiency elevators; solar ready bus depot canopy. • Lower light power density per Stretch Code • EEM Certification to EOEEA	MassDOT	TBD	Post-Construction
Noise and Vibration	Noise walls: • Allston Village & Pratt and Wadsworth Street Area • Lincoln Street: between Cambridge & Everett Streets and between Everett and Market Streets. • B.U. Area-Nickerson Field: atop existing retaining wall	MassDOT	TBD	Construction

Mitigation Summary Table I-90 Preferred Urban Interchange Alternative and 3K-ABC Throat Area Variation

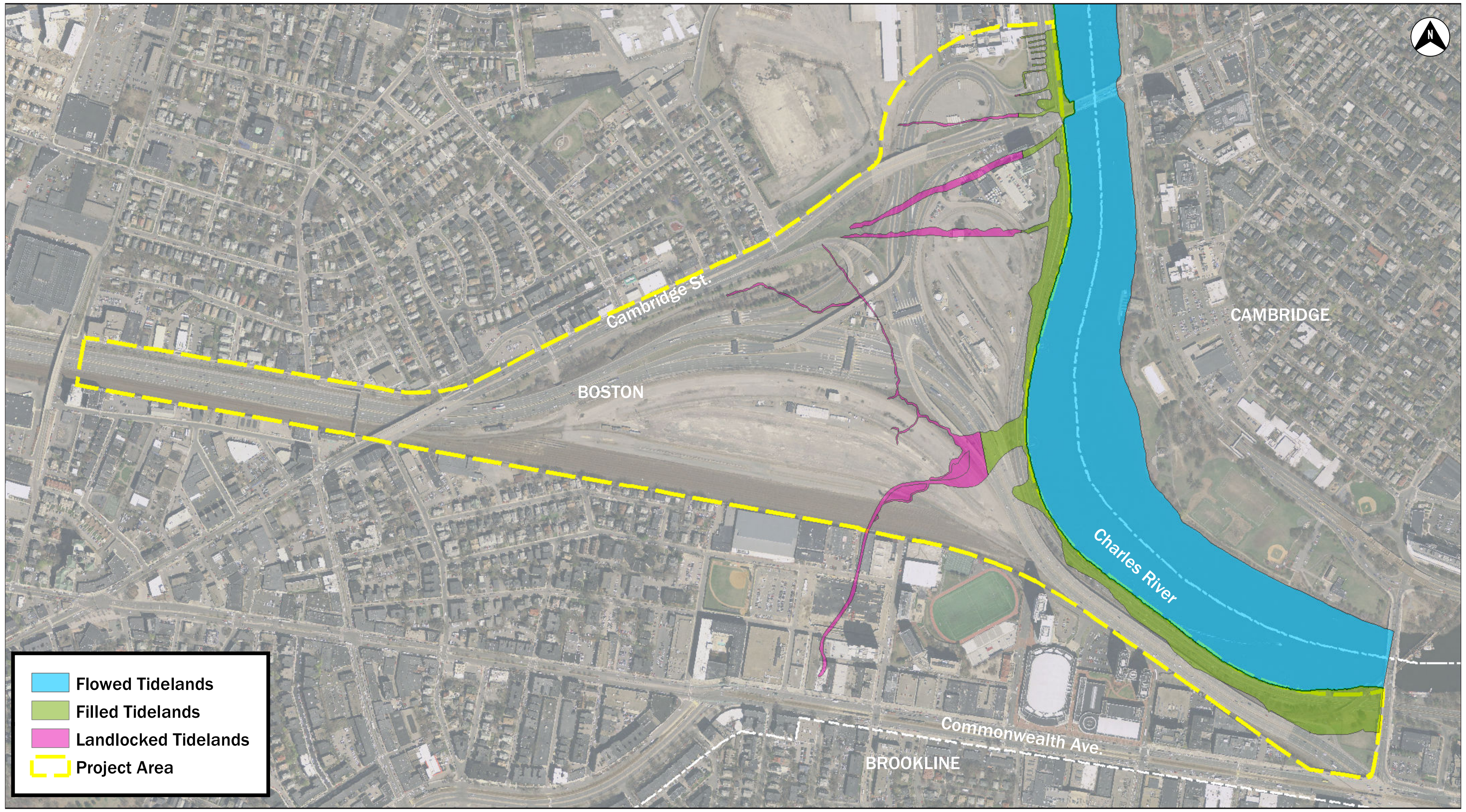
Environmental Impact	Mitigation Measure	Responsible Party	Estimated Cost	Estimated Schedule
Wetlands				
Construction Term	Implementation of Stormwater Pollution Prevention Plan; BMPs associated with dredging activities	MassDOT	TBD	Construction Duration
Operation Term	Compensatory flood storage for occupation of floodplain; mitigation required for alteration to Land Under Water and Bank			
Waterways	Creation of 1.58 acres of net new public parkland within Ch. 91 jurisdiction	MassDOT	TBD	Construction
Navigation				
Construction Term	Navigation plan for approval by DCR, Boston Conservation Commission, Harbormaster, and boating community	MassDOT	TBD	Prior to construction start
Operation Term	None anticipated			
Fisheries				
Construction Term	Time of year restrictions may be imposed; Construction techniques to minimize sediment, turbidity and noise	MassDOT	TBD	Construction term
Operation Term	None anticipated		TBD	
Stormwater Management and Water Quality				
Operation Term	Designed in conformance with MA DEP Water Quality Standards; Maintenance according to Operations and Maintenance Plan Meets TMDL target for reduced phosphorous and pathogens	MassDOT	TBD	Perpetuity
Utilities				
Construction Term	Coordination with various utility owners to maintain operations	MassDOT	TBD	Prior to and during construction
Operation Term	Coordination with various utility owners for capacity and relocation plans	MassDOT	TBD	Prior to construction
Water Consumption	None required			
Wastewater Generation	None required			
Climate Change	Design: Explore blocking pathways to prevent inland surge and inundation; redirect storm surge inundation away from critical infrastructure towards retention areas if required	MassDOT	TBD	To be reevaluated in future to determine if increase in upstream discharges, SLR and storm surge overtopping of Charles River Dam; diversion or pumping of flood waters may be required
Oil and Hazardous Materials				
Construction Term	• Preconstruction characterization of areas to be disturbed; Management of Oil and Hazardous Materials encountered during construction will be managed based on Massachusetts Contingency Plan. • Media management: Soil Management Plans, Excavated Materials Management Plans. Remediation General Permit for discharge of OHM impacted groundwater. Implementation of Spill Control Program.	MassDOT	TBD	Construction Term

8 Public Benefit Determination

The I-90 Allston Interchange Project exceeds Environmental Impact Report (EIR) review thresholds as defined in the Massachusetts Environmental Policy Act (MEPA) Regulations found at 301 CMR 11.03. In accordance with 301 CMR 13.00 (Public Benefit Determination Regulations), a mandatory Public Benefit Review must be conducted for any project that is required to file an EIR and is completely or partially located in tidelands or landlocked tidelands.

Filled tidelands are those areas formerly submerged that are no longer subject to tidal action. Landlocked tidelands are any filled tidelands, which on January 1, 1984, were entirely separated by a public way or interconnected public ways from any flowed tidelands, except for that portion of such filled tidelands that are presently located: (a) within 250 feet of the high water mark; or (b) within any Designated Port Area. Said public way or ways shall also be defined as landlocked tidelands, except for any portion thereof that is presently within 250 feet of the high water mark. Soldiers Field Road (SFR), a public way, is located directly adjacent to the Charles River so filled tidelands in the Project Area are limited to those tidelands located within 250 feet of the river.

This chapter describes how the Project will provide appropriate public benefits and adequate protection of the public trust rights inherent in tidelands.



Graphic 8.1-1: Plan showing filled, flowed and landlocked tidelands

8.1 Nature of Affected Tidelands

The tidelands located in the Project Area are associated with the Charles River, a non-tidal river. The river itself is considered flowed tidelands, as shown in blue on Graphic 8.1-1. The area located along the west of the Charles River, or Project side, is considered filled tidelands and shown in green. The majority of the filled tidelands located on the Project site are currently occupied by SFR and the Dr. Paul Dudley White Bike Path (PDW Path). There are also landlocked tidelands within the Project Area. The landlocked tidelands, shown in pink, are mainly located in the rail yard (former Salt Creek) and other former tributaries to the Charles River in the Project Area south of Cambridge Street.

8.2 Compliance with Standards

According to the Public Benefit Determination Regulations, the Secretary is required to consider the following criteria when making a determination:

- Purpose and effect of the development;
- Impact on abutters and the surrounding community;
- Enhancement of the property;
- Benefits to the public trust rights in tidelands or other associated rights, including but not limited to, benefits provided through previously obtained municipal permits;
- Community activities on the development site;
- Environmental protection and preservation; and
- Public health, safety and the general welfare.

8.2.1 Purpose and Effect of the Development

The purpose of the Project is to replace the obsolete, structurally deficient I-90 viaduct highway ramp with a safer roadway and improve congestion and mobility in the surrounding area by providing a new interchange consisting of a network of ramps and at grade connections. In addition, the Purpose is to realign and redesign the highway to facilitate safe operations associated with all electronic tolling (AET). The Massachusetts Department of Transportation (MassDOT) is also developing the Project to reduce greenhouse gas (GHG) emissions, promote the healthy transportation options of walking, bicycling and public transit, and support smart growth development.

The purpose of the Beacon Park Yard (BPY) layover and maintenance facility, or "rail operations," is to support the current and future railroad operations at South Station. The existing layover and maintenance facilities are insufficient; neither the capacity nor the location of vehicle facilities meet existing program needs and railroad operational requirements.

The purpose of the new West Station is to provide a neighborhood-oriented, multi-modal commuter rail station in an area surrounded by higher education facilities and residences, with multi-modal transit hub connections including rail, bus, bicycle and pedestrian.

8.2.2 Impact on Abutters and Community

Public involvement, outreach and comment have shaped the Project between each major milestone to date, from the ENF filing through to this Draft Environmental Impact Report (DEIR). The public outreach effort included 22 meetings with the Task Force and seven public information meetings. See Table 9.2-2 for a summary of public meetings.

The benefit of the Project is substantial with respect to providing infrastructure to support active transportation modes and economic development; improving air quality by eliminating queues associated with tolls and idling at intersections; and providing access for alternative modes of transportation in the Project Area where currently constrained or non-existent.

8.2.3 Enhancement of Property

The reconfiguration of the highway interchange and the straightening of highway alignment will create an urban interchange, which in turn, will create developable lots to the north of the highway. The creation of these lots will change the land use of this area as Harvard University anticipates using this space for new development. Land use is anticipated to change from highway use to a mix of institutional, commercial and residential use, as described in the Harvard University Institutional Master Plan (IMP). This anticipated future economic development growth will spur the need for additional public transit service in the Project Area. Thus, the Project presents an opportunity to integrate the design and construction of a new commuter rail and bus station (West Station) in anticipation of current and future demand.

8.2.4 Benefits to the Public Trust Rights in Tidelands or Other Associated Rights, including but not limited to, Benefits Provided through Previously Obtained Municipal Permits

Under Chapter 91, public rights designed to protect the free exercise of navigation, fishing and fowling are collectively known as "public trust rights." These public rights are exercised in the intertidal area between high and low water. The Project Area is located adjacent to a non-tidal river so there is no intertidal area in the Project Area.

Other interests of the waterways regulations include providing public access for the use and enjoyment of waterways. Under all three Throat Area Variations, there is a significant open space opportunity with the expansion of the parklands along the Charles River adjacent to the Project Area, and improved access from the surrounding neighborhoods along the north side of Cambridge Street South. At its widest point in all Throat Area Variations, the parkland will expand from 14 feet to 155 feet in width. The majority of this public parkland will be located within filled tidelands. In addition, the expanded parkland will allow for new separated bicycle and pedestrian paths along the river.

8.2.5 Community Activities on Site

The new public parkland along the Charles River will increase public activity along the riverfront. Cambridge Street South will be a new connector, serving as the primary pedestrian and bicyclist connection from neighborhoods to the north and south of I-90 to the Charles River Reservation. Two-way separated bike lanes, sidewalk and two rows of tree plantings will define the north side of Cambridge Street South as a greenway to the Charles River Reservation.

8.2.6 Environmental Protection/Preservation

The Project will require multiple local, state and federal approvals. These reviews and required approvals will ensure the Project minimizes potential environmental impacts to the extent practicable and provides appropriate mitigation for unavoidable impacts.

The new parkland will become part of the Massachusetts Department of Conservation and Recreation (DCR) Charles River Reservation and will be protected open space.

8.2.7 Public Health and Safety and General Welfare

The Project will protect the general welfare by improving public infrastructure and expanding transportation capacity. All improvements will continue to be planned in consultation with local, state and federal agencies to avoid potential adverse impacts and maximize public benefits.

An ancillary benefit of the rail layover and maintenance facility will be improved air quality. Locating the layover facilities near the major terminals will reduce the number and length of train trips while allowing the Massachusetts Bay Transportation Authority (MBTA) to relieve congestion at those terminals, minimize track conflicts, and avoid unnecessary and wasteful operation of trains simply to maintain schedules.

9 Response to Comments and Public Involvement

An ENF for the I-90 Allston Interchange Project was submitted by MassDOT to the MEPA Office of the Massachusetts Office of Energy and Environmental Affairs (EEA) on October 31, 2014. On December 24, 2014, the Secretary of Energy and Environmental Affairs issued the Certificate on the ENF (ENF Certificate) outlining the scope for the Draft Environmental Impact Report (DEIR).

Section 9.1 includes responses to comments provided in the Massachusetts Environmental Policy Act (MEPA) Certificate for the Environmental Notification Form (ENF), and public and agency comments received during the ENF comment period.

Section 9.2 provides an overview of the public involvement process, a list of Allston Task Force Members and a list of public participation events held to date.

Section 9.3 includes a list of commenters on the ENF. It also includes copies of comment letters sent to MEPA, with annotations showing the numbering of specific comments.

Aerial view of the Project Area looking west

9.1 Response to Comments

Responses to many of the issues raised in the Secretary's Certificate and the comment letters are provided in preceding DEIR chapters. This section includes an individual response to each specific comment in the ENF Certificate and comment letters. As appropriate, a brief response is provided along with a reference to more detailed information in other sections of the document, or a detailed response is provided when the information is not available elsewhere.

9.1.1 Frequently Asked Questions and Responses

Numerous comments were received that were similar in subject matter. Responses to these Frequently Asked Questions are provided in this section.

Pedestrian and Bicycle

1: How will the Project accommodate pedestrians and bicycles?

Response: The Project will provide extensive bicycle and pedestrian infrastructure improvements, including the creation of new connections to Soldiers Field Road (SFR) and the replacement of the existing bridge connections over I-90 with a new pedestrian and bicycle bridge west of the existing Cambridge Street bridge. The urban interchange street network will provide pedestrian and bicycle facilities along Cambridge Street and Cambridge Street South, and along all of the north-south connecting streets, providing linkages to the Dr. Paul Dudley White Bike Path (PDW Path) and to West Station and Commonwealth Avenue. The primary east-west connection will be an at-grade pedestrian and bicycle route along Cambridge Street South, crossing over a depressed portion of SFR and linking to the PDW Path and enhanced open space along the Charles River. All pedestrian and bicycle routes will meet Americans with Disabilities Act/Massachusetts Architectural Access Board (ADA/AAB) requirements. The new pedestrian bridge will maintain connections from the Franklin Street/Lincoln Street area over I-90 to the Cambridge Street/Harvard Avenue area. See Graphic 5.7-1 and Section 5.7.

2: Reviewers request that MassDOT study a multi-use community path connecting Allston to Cambridge via the Grand Junction Rail (GJR) Bridge crossing the Charles under the Boston University (BU) Bridge.

Response: A multi-use path connection across the GJR Bridge to Cambridge is beyond the scope of the Project. The Project will include major improvements to pedestrian and bicycle infrastructure to connect Allston with Cambridge across the Charles River via existing bridges. It will also include significant amounts of new pedestrian and bicycle infrastructure, including a connection over SFR to connect Allston with the PDW Path along the Charles River, which will provide additional connections to Cambridge. See Section 5.7.

Open Space

1 and 2: How will this Project maximize parkland and provide river access for the community? Will the Project incorporate acres of new parkland along the Charles River into a new "Allston Esplanade?"

Response: The Project will provide a net increase of parkland along the Charles River. It will greatly improve accessibility to that parkland through the creation of an at-grade pedestrian/bicycle crossing from the sidewalk and a separated two-way bike lane on the north side of Cambridge Street South, which connects to neighborhoods to the north and to the south of the interchange area. Neighborhoods to the north and south of the interchange area will benefit from new connections with sidewalks and protected bike lanes. See Section 5.4 and Section 5.7.

Noise and Vibration

1: What is being done to control/reduce the noise associated with this Project?

Response: Mitigation measures will be included in select locations, as warranted, based on the Noise Study, which takes into account levels at various locations within and adjacent to the Project vicinity. Section 4.11 discusses existing noise. Section 5.11 discusses Project noise and vibration impacts, and Section 7.11 discusses mitigation for noise impacts. In addition, Appendix H, Noise and Vibration Analysis, provides a detailed analysis of the Project noise impacts.

West Station

1: Reviewers request that MassDOT study a new "West Station" transit station that provides rapid transit service (every 10 minutes) to downtown and Kendall Square.

Response: The Project includes a West Station that will provide a "neighborhood style" commuter rail station with bus service connections. No commuter parking will be provided. Developing alternatives for rapid transit services to downtown and Kendall Square is beyond the scope of the Project, however, the Project will not preclude implementation of rapid transit services or connections to Kendall Square via the GJR in the future.

2: How will the access to West Station be integrated into the site?

Response: Unrestricted pedestrian and bicycle connections between the neighborhood to the south, across the layover yard and I-90, to Cambridge Street and the PDW Path will be provided. See Sections 5.3.4 and 5.7.4.

Traffic

1: Reviewers request that MassDOT study extending existing roads to connect Commonwealth Avenue and Cambridge Street (to reduce cut-through traffic through Harvard Avenue and Linden Street).

Response: MassDOT has studied the benefits/impacts of providing a new roadway connection between Commonwealth Avenue and Cambridge Street. Two options were evaluated: (1) a connection open to all traffic; and (2) a connection limited to buses only. Although construction of this connection is not included as part of the Project, the Project design will not preclude the implementation of this roadway connection by others in the future. A summary of the evaluation can be found in Section 5.8.2.4. Detailed results of the evaluation are provided in Appendix C, Traffic Operations Study.

2: What is being done to improve bus access in the area?

Response: The proposed roadway network will include a grid system to allow flexibility in the future to modify existing bus routes, or to add new bus routes, and to be responsive to future development patterns in Beacon Park Yard (BPY) and the Harvard University Enterprise Zone. The roadway cross-sections will also be designed with the flexibility necessary to provide bus stops in the future once the optimum locations of the stops are determined (again, in response to future redevelopment patterns). Finally, the roadway network will maximize bus access/egress options for the future West Station by providing access/egress via two, two-way roadways, the Seattle Street Connector and the Cattle Drive Connector, which will connect to a two-way bus loop system at the station.

3: How will this Project manage the flow of traffic in the surrounding neighborhoods?

Response: Several components of the I-90 Urban Interchange Preferred Alternative 3K will re-orient traffic away from Cambridge Street, North Harvard Street and the North Allston neighborhood. These components include: (1) elimination of the existing SFR westbound off-ramp to Cambridge Street; (2) construction of a new SFR eastbound on-ramp and a new SFR westbound off-ramp at Cambridge Street South; (3) construction of a new east-west roadway (Cambridge Street South) south of Cambridge Street between Lincoln Street and the new SFR on/off-ramps; (4) construction of a new north-south roadway (East Drive) between Cambridge Street and Western Avenue by MassDOT and Harvard University; and (5) provision of five connection points between the I-90 ramps and Cambridge Street/Cambridge Street South that will disperse rather than concentrate traffic coming from, or headed to, I-90.

4: Reviewers request that MassDOT study new Mass Pike on- and off-ramps near Beacon Street to serve the Kenmore/Fenway/Longwood area (to get those cars off of Allston's streets and Storrow Drive).

Response: Examination of possible new ramps on I-90 at Park Drive or Beacon Street is beyond the scope of the Project.

Public Outreach Efforts

1: How can Task Force members and stakeholders continue to participate in the planning and design stages of the Project?

Response: Producing comment letters on this DEIR is the next recommended opportunity for Task Force members and stakeholders to continue to participate in the Project development. Comments on the DEIR will be considered by MassDOT when selecting one of the three Throat Area Variations and considering further Project refinements to completely define a Preferred Alternative to be described in the Final Environmental Impact Report (FEIR). Comments will also be sought on the FEIR. Subsequent opportunities for public input will occur during the Project design phase, including a design public hearing.

Future Development/Decking/Utilities

1, 2 and 3: How will this Project provide for future development? What is being done to maximize the feasibility of air rights development? Reviewers request that MassDOT study decking over the highway and rail yard to cover them, protect residential quality of life, and connect the existing and new neighborhoods.

Response: In response to stakeholder concerns, MassDOT evaluated potential scenarios for constructing non-transportation infrastructure above the rail yard and West Station. Two scenarios were considered: (1) Harvard University exercises its air rights at some point in the future and constructs a mixed-use development above and across the entire yard, service tracks and West Station; and (2) MassDOT constructs decking over BPY as a possible mitigation measure for perceived noise, vibration and air quality impacts while also improving the visual character of the Project Area. MassDOT evaluated the feasibility of decking over BPY and determined that decking was not a reasonable mitigation measure due to the anticipated cost and schedule impacts.

Decking above the rail yard would encompass an area of 15 acres. It would have to be built to bridge design standards and outfitted with multiple ventilation vents and stormwater management components. MassDOT would not be able to design the decking and its substructures to accommodate the unknown features of future overbuild construction, therefore, the decking would need to be removed should Harvard exercise its development air rights. MassDOT determined this would not be a reasonable use of state funds.

Under the I-90 Urban Interchange Preferred Alternative 3K and Throat Area Variations, land use impacts will include reconfiguring the highway interchange, straightening the highway alignment and creating an urban interchange, which in turn, will create developable lots to the north of the highway for use by the property owner (Harvard University), see Section 5.2.2. The creation of these lots will change the land use of this area from highway to institutional, commercial and residential uses, consistent with the mix of land uses described in Harvard University's Institutional Master Plan (IMP).

There will be an opportunity to create approximately 1.5-million-square-feet of surface area for potential air rights development over I-90 and the I-90 ramps connecting to the I-90 Urban Interchange Preferred Alternative 3K street grid network, West Station, the MBTA commuter rail layover yard and the Worcester Main Line. See Graphic 5.2-3. Provisions have been made for potential air rights development by aligning the rail tracks, rail facilities and access roads to accommodate columns 42-feet on-center between the track pairs which are spaced at 20 feet apart from east to west. See Section 5.2.

MassDOT continues to coordinate with Harvard on its plans for future air rights development over the BPY layover facility and West Station. At this time, Harvard University is not able to provide MassDOT with a future development plan to allow the design and construction of overbuild foundations concurrent with the Preferred Alternative 3K. It is not feasible for MassDOT to construct air rights foundations under a private/public partnership arrangement until future building designs are advanced.

Decking this location will be in place for up to 30 years and be expensive. MassDOT understands the BPY overbuild area is among the last construction phases planned within the district (30 to 75 years forward). To not preclude future overbuild activities, the conceptual design provides locations throughout the yard where future foundations and building columns could be placed without permanent impact to the proposed railroad and transit infrastructure.

Decking over the layover yard would also require a large, temporary ventilation system to draw and exhaust diesel fumes from below the covered area. MassDOT understands it would be obligated to provide ventilation at a later date when the overbuild is constructed. It is not prudent at this point to design for future air quality needs when the future overbuild development is uncertain, as is the ability of future vehicle propulsion technology, such as diesel hybrid, to lessen future vehicle emissions. See Section 5.2.

4: How is MassDOT planning for utility systems as part of the Project and for future development?

Response: The existing utilities will be removed and terminated at Cambridge Street when the Project is constructed. New utility infrastructure to service the Project will be installed within the new highway and street system. However, several large water and sewer mains that currently traverse the Project Area will remain in their existing locations. These facilities are located within permanent easements and are owned by either the Massachusetts Water Resources Authority (MWRA) or the Boston Water and Sewer Commission (BWSC). See Section 5.18.

9.1.2 Responses to MEPA ENF Certificate and Comment Letters

Executive Office of Energy and Environmental Affairs (EEA)

EEA-1: The DEIR should include a detailed description of each project element and describe any changes to the project since the filing of the ENF.

Response: Section 1.1.1 and Chapter 3 provide a description of the Project elements and a discussion of how the Project evolved since the ENF filing.

EEA-2: The DEIR should include updated site plans for existing and post-development conditions for each project alternative. Given the numerous project elements, MassDOT may include overall plans for regional and local context supplemented by plans that focus on specific project areas (e.g., West Station, SFR, Cambridge Street) or amenities (e.g., pedestrian connections, bicycle accommodations, etc.) to allow for the presentation of details at a legible scale.

Response: Updated existing conditions plans, graphics, figures and photographs are provided in Chapter 4. Proposed plans, graphics and figures at various scales, including those for the three Throat Area Variations (3K-HV, 3K-AMP and 3K-ABC), are provided in Chapter 5. Plans have been broken down by Project Area and amenities.

EEA-3: Existing and proposed conditions site plans should clearly identify environmental resources including: wetland resource areas; c.91 jurisdictional limits; stormwater, wastewater and water supply infrastructure; and historic resources. These plans should also identify roadway infrastructure (classified by at-grade or above-grade), bicycle and pedestrian corridors, on-street accommodations and access points to key destinations, the type and location of potential vehicle and bicycle parking (including expanded shared bicycle infrastructure), track placement and dedicated rail facilities (i.e., Houghton Chemical Company, CSX, etc.), rail activity support buildings or structures, and adjacent land uses. MassDOT, CSX and Harvard University must work cooperatively to ensure proper access to the project site to ensure the acquisition of data in support of the preparation of the DEIR.

Response: The description and depiction of the existing conditions and proposed conditions are provided as follows:

- *Existing state and federal wetlands jurisdiction:* Section 4.12.1, Figures 4.12-1 and 4.12-2, Graphics 4.12.1 through 4.12.3
  Proposed wetland impacts: Section 5.12.1, Figures 5.12-1 through 5.12-3
- *Existing Chapter 91:* Section 4.12.2, Figure 4.12-2, Graphic 4.12-4
  Proposed Chapter 91: Section 5.12.6, Figures 5.12-4 through 5.12-7
- *Existing wastewater and water supply:* Section 4.18, Figure 4.18-1
  Proposed wastewater and water supply: Section 5.18, Figure 5.18-1 through 5.18-3
- *Existing stormwater:* Section 4.17, Figures 4.17-1 and 4.17-2
  Proposed stormwater: Section 5.17, Figures 5-17.1 through 5.17-4
- *Existing historic resources:* Section 4.4.6, Figure 4.6-1
  Proposed historic impacts: Section 5.6, Figures 5.4-1 through 5.4-6 and 5.6-1 through 5.6-3
- *Existing pedestrian and bicycle connections:* Section 4.7, Figures 4.7-1 and 4.7-2
  Proposed pedestrian and bicycle connections: Section 5.7, Graphic 5.7-1 through 5.7-14
- *Existing roadway infrastructure:* Section 4.8, Figures 4.8-1 through 4.8-7, Appendix C
  Proposed roadway infrastructure: Section 5.8, Figures 5.8-1 through 5.8-3, Appendix C
- *Existing rail support:* Section 4.9, Figure 4.9-1 and 4.9-2
  Proposed rail: Section 5.9, Graphics 5.9-1 through 5.9-6

Proposed on-street parking locations on Cambridge Street are shown, but not in the proposed street grid. The reasons for not showing parking elsewhere is that future development will dictate the basis for parking demand and will be developed in coordination with the City of Boston.

West Station includes bicycle parking. Bike rack locations on Cambridge Street and within the street grid will be accommodated; specific locations will be established when final design details are developed in coordination with the City of Boston.

EEA-4: Given the myriad land ownership, easement rights, and roadway jurisdictional conflicts on-site, the DEIR should include graphics that clearly delineate and describe either existing land ownership or acquisitions, easements and associated rights (e.g., rail operations, sewer lines, drainage culverts, etc.) required for project construction, and roadway and intersection jurisdictions.

Response: Figure 4.2-1 and 4.2-2 show the existing parcel ownership and easements within the Project Area. Figure 5.2-1 shows the easements and ownership associated with the I-90 Urban Interchange Preferred Alternative 3K conceptual jurisdictional boundaries of future roadways. Property acquisitions will be required at the north end of Malvern Street (at 76 Ashford Street) in order to construct the pedestrian and bicycle connections to West Station, from portions of the former Ace Ticket building along with portions of Regina Pizzeria property at the northern terminus of Franklin Street for the reconstruction of the Franklin Street pedestrian bridge, and from BU. Once a Preferred Alternative for the Throat Area is advanced, final locations and extent of acquisitions and easements will be presented in the FEIR.

EEA-5: The DEIR should also provide plans at a reasonable scale to discern limits of roadway rights-of-way and adjacent Article 97 and/or parkland/open space, particularly in the area within and adjacent to SFR between the BU Bridge and the Cambridge Street/River Street intersection.

Response: Figure 4.6-2 shows the limits of Department of Conservation and Recreation (DCR) land adjacent to SFR between the BU Bridge and the Cambridge Street/River Street intersection. All DCR land shown on the plan is considered both Article 97 and Section 4(f) Land. Figures 5.4-1 through 5.4-9 show the Section 4(f)/Article 97 Impacts for each Throat Area Variation.

EEA-6: The DEIR should also clarify the current allowed uses on-site, as granted to CSX and MassDOT by Harvard University, which form the basis of the No Build Alternative. The ENF noted that a No Build Alternative would include the construction and operation of a layover facility at BPY, although Harvard University disputes the inclusion of this activity in the No Build scenario.

Response: MBTA retains rights within their existing rail easement to construct a limited amount of layover capacity without requiring Harvard approval. MBTA's schedule to add these new tracks is independent of the No Build scenario. See Sections 3.2 and 5.9.

EEA-7: MassDOT and the MBTA will need to acquire from Harvard, easement rights over portions of the project site (in which Harvard will also have retained rights), in order to build the project. As noted in Harvard University's comment on the ENF, given these land development rights, MassDOT's project should be designed to optimize and not hinder, future transit-oriented growth and maximize the feasibility and viability of air rights development.

Response: The proposed street grid system north of I-90 has been developed with input from the property owner, the City of Boston and the Project Task Force in order to maximize the transit-oriented development potential within the BPY, while still providing the necessary transportation infrastructure to support future travel demands. The street grid system responds to the Placemaking Study developed by the City, where it improves the geometric layout by enhancing the potential for future development. The goals of the Placemaking Study are discussed in Section 3.1.3.

There will be an approximate 1.5-million-square-foot surface area for potential air rights development over I-90 and the I-90 ramps connecting to the Preferred Alternative 3K street grid network, West Station, the MBTA commuter rail layover yard and the Worcester Main Line. See Graphic 5.2-3. The Project will not preclude future air rights development, as provisions were made for potential air rights development by aligning the rail tracks, rail facilities and access roads to accommodate columns 42-feet on-center between the track pairs which are spaced at 20 feet apart from east to west. See Sections 3.2 and 5.2.

MassDOT continues to coordinate with Harvard on its plans for future air rights development over the BPY layover facility and West Station. At this time, Harvard University is not able to provide MassDOT with a future development plan to allow the design and construction of overbuild foundations concurrent with Preferred Alternative 3K. It is not feasible for MassDOT to construct air rights foundations under a private/public partnership arrangement until future building designs are advanced.

Decking this location would be in place for up to 30 years and be expensive. MassDOT understands the BPY overbuild area is among the last construction phases planned within the district (30 to 75 years forward). To not preclude future overbuild activities, the conceptual design provides locations throughout the yard where future foundations and building columns could be placed without permanent impact to the proposed railroad and transit infrastructure.

Decking over the layover yard would also require a large, temporary ventilation system to draw and exhaust diesel fumes from below the covered area. MassDOT understands it would be obligated to provide ventilation at a later date when the overbuild is constructed. It is not prudent at this point to design for future air quality needs when the future overbuild development is uncertain, as is the ability of future vehicle propulsion technology, such as diesel hybrid, to lesson future vehicle emissions. See Section 5.2.

EEA-8: The DEIR should clarify the proposed activities to be undertaken at the BPY layover facility. The DEIR should describe the nature of each activity, anticipated frequency, potential environmental impacts (e.g., wastewater discharge, noise and vibration, etc.), and hours of operation. The DEIR should discuss the purpose and need for these activities at this particular location, and if they are not performed at BPY, if there is an alternative location where these activities will be conducted. MassDOT should clarify assertions made by Harvard University that wheel truing and car wash facilities would preclude the ability to construct decking necessary to support future air rights development over the layover facility.

Response: Preliminary layouts and designs of the BPY layover facility were developed and discussed with Harvard University and key stakeholders. All elements associated with the BPY layover facility and West Station will be designed so as to not impede future air rights development over the yard.

An assessment of the potential BPY layover facility functions and activities is included in Appendix A, Rail Yard and West Station Alternatives Analysis. Section 2.1.2 discusses the Purpose and Need of the facility elements, as well as the evaluation of five alternatives. Potential environmental impacts from the proposed facilities are discussed in Chapter 5 and in the response to EEA-7.

EEA-9: The DEIR should include a discussion of future permitting requirements associated with the project, identifying permitting requirements specific to each project element. Additionally, while this project is not subject to the EEA Environmental Justice Policy, MassDOT has committed to evaluate the project for potential impacts to EJ communities based on federal and state guidelines. The effects, positive and negative, of the project alternatives on EJ populations will be evaluated relative to their overall effects to determine whether impacts in the No Build and Build conditions will be disproportionate or adverse on EJ communities or populations.

Response: The Project requires several federal, state and local permits, as shown on Table 6.1 in Chapter 6.

According to a preliminary assessment using Census 2010 data and MassGIS Environmental Justice (EJ) communities data layer, EJ communities are present on and adjacent to the Site. Adjacent communities are classified as EJ due to minority status and low-income status. MassDOT is evaluating the Project for potential impacts to EJ communities based on federal and state guidelines. This DEIR evaluates potential impacts to EJ communicates for the Project and the No Build Alternative. The Build and No Build scenarios were found to not have a disproportionate impact on EJ communities. See Section 5.23 and supported by Appendix C Socioeconomic Data.

EEA-10: The DEIR should expand the discussion presented in the ENF regarding project compliance or consistency with local and regional planning documents. In particular, the project's relationship to DCR's Charles River Basin Master Plan, local and regional bicycle plans, and current MassDOT transportation planning and capital expenditure documents.

Response: The Project will be consistent with the objectives of the Boston MPO's Long Range Transportation Plan (LRTP) *Charting Progress to 2040*, which are to develop a "modern transportation system that is safe, uses new technologies, provides equitable access, excellent mobility, and varied transportation options — in support of a sustainable, healthy, livable, and economically vibrant region." The Project is currently listed as a Pre-TIP project on the LRTP.

The Project complies with a number of the goals set by the DCR Master Plan. See Section 5.2.2.3. The Project will significantly enhance pedestrian and bicycle connections between the Allston neighborhoods and the PDW Path in the Charles River Basin, consistent with the DCR's Master Plan for the Basin. See Section 5.7 for a description of Project coordination with local and regional bicycle plans.

EEA-11: In the absence of a clear planning directive for the future development of Harvard University's property within the Study Area, advancement of many critical components will be delayed. I strongly encourage Harvard University and the BRA to work cooperatively with MassDOT on land use assumptions. The commencement of a visioning process concurrent with the development of land use assumptions would support advancement of the project and associated MEPA review.

Response: MassDOT coordinated land use assumptions with Harvard early on in the Project planning process to develop reasonable development assumptions for the interchange area. The Harvard guidance was used to develop inputs into the Central Transportation Planning Staff's (CTPS) regional model to assess future traffic and transportation patterns in the Project Area. In addition, the Project responds to the criteria set in the I-90 Allston Interchange Placemaking Study developed by the City. Information discussed to date is included in Section 3.1.3.

EEA-12: As noted in the ENF, a Task Force was convened to assist MassDOT in the preparation of interchange alternatives and other project elements. MassDOT has committed to continue to hold quarterly public meetings to update the public on project details, progress on the completion of the EIR, and to solicit future input. The DEIR should include a proposed format and protocols for future input by a Task Force as additional components of the project are analyzed and enter preliminary design, either as part of the MEPA review process or upon commencement of advanced construction and design efforts. The protocol should address the extent to which establishment and ongoing participation of the Task Force is contingent upon the scheduled funding and design of the project.

Response: Producing comment letters on this DEIR is the next opportunity for Task Force members and stakeholders to continue to participate in the development of the Project. Comments on the DEIR will be considered by MassDOT when selecting one of the three Throat Area Variations and considering further Project refinements to completely define a Preferred Alternative to be described in the Final Environmental Impact Report (FEIR). Comments will also be sought on the FEIR. Subsequent opportunities for public input will occur during the Project design phase, including a design public hearing.

MassDOT is committed to continuing to update the Task Force on the Project. Regular meetings will continue through Project design. Since the publication of the ENF, 22 Task Force meetings were convened and a Public Information Session was held on June 17, 2015. A list of public participation events held to date is provided in Table 9.2-2. In addition, a link to the Task Force Meeting minutes and public meeting agendas on MassDOT's web site is: http://www.massdot.state.ma.us/highway/HighlightedProjects/AllstonI90InterchangeImprovementProject/Documents.aspx.

EEA-13: The DEIR should include an expanded alternative analysis that fleshes out the various project elements and conceptual design both individually, and as a cohesive and integrated system, to allow for adequate assessment of how the project avoids, minimizes and mitigates Damage to the Environment. Each alternative presented should include conceptual site layout plans, a summary of potential environmental impacts associated with each of these alternatives, preferably in tabular format, and a supporting narrative. For those project elements that may directly impact operations, the alternatives analysis should compare efficacy (LOS, 95th percentile queues, etc.) between each alternative in the 2020 build and 2035 future build scenarios.

Response: The Alternatives Analysis in Chapter 3 provides a description of the design evolution of both the roadway and West Station elements of the Project. Chapter 3 also includes figures showing the layout of the Preferred Alternative and the three Throat Area Variations. Table 1.2.1 shows a comparison and a Variation Evaluation Summary Matrix. Chapter 5 provides a Review of Impacts narrative, and Section 5.8.2 and Appendix C include the traffic operational analyses.

The Project Design Year was adjusted from 2035 to 2040 in order to be consistent with the planning horizon of other major MassDOT infrastructure projects within the Boston Metropolitan Region. The Opening Year analysis was adjusted from 2020 to 2025 for two reasons: (1) completion of Project construction by 2025 was determined to be more realistic than by 2020, given the current status of the Project's environmental review and permitting; and (2), to take advantage of the 2025 regional land use projections that had been previously developed by CTPS, which could be readily applied to the transportation modeling prepared for this Project Alternative.

Although each element can be designed individually, due to the limited space within the Project Area, modifications to any individual Project component effects the design of other Project elements. Therefore, the entire Project must be viewed as an integrated system. For example, the roadway profile of I-90 influences designs for the West Station and bus loop, and the platform locations influence the layout of BPY. Evaluation of each Project element, and the cumulative impacts of the Project, are provided in Chapter 5.

EEA-14: Assessment of each alternative should consider potential impacts on existing or planned rail (freight or commuter) operations within and through the site. If alternatives will preclude or require the relocation of rail operations, the DEIR should explicitly state as such, identify relocated track locations (if applicable), and discuss the specific ramifications to maintaining rail service within the study area.

Response: A discussion of the existing and future rail operations through the Project Area is provided in Sections 4.9, Existing Rail Operations, and 5.9, Future Rail Operations. None of the Throat Area Variations will preclude future rail operations, including freight service and schedules, and possible future uses such as urban transit or the use of GJR as a two-track system. All of the alternatives would require minor shifts in track alignment, but would not require fully relocating rail operations. Additional alternatives have been developed since the publication of the ENF. These are detailed in Section 3.2.1 and Appendix A, Rail Yard and West Station Alternatives Analysis.

EEA-15: MassDOT should consider how the project will shape future air rights development over West Station, BPY or other on-site rail infrastructure and avoid constraining feasibility of construction.

Response: As the Project design progresses, MassDOT will continue to coordinate with Harvard University to ensure that designs allow for future overbuild. A preliminary column layout was established throughout the rail yard to ensure there is ample space to support future air rights development. Utilities are proposed outside of the future column foundations. Rail yard buildings will be located to accommodate future air rights and meet minimum vertical clearances. Due to potential enclosure of the West Station area in the Preferred Alternative, space has been provided in the design to allow for a ventilation system to be constructed, if needed, which would vent diesel exhaust from the train engines. See response to FAQ Future Development/Decking/Utilities 1 through 3.

EEA-16: For purposes of comparison, the DEIR should present a No Build Alternative representative of the current conditions and allowed uses on-site. This No Build Alternative should also be expanded to consider background growth and identified infrastructure projects (either by the City of Boston, City of Cambridge, MassDOT, BWSC, MWRA, or others) in the study area that can reasonably be expected to be funded and constructed by the 2020 project completion date.

Response: Chapter 5 analyzes the expected future conditions of the Project Area under a scenario in which the Project does not occur (the No Build Alternative) and under scenarios where the Preferred Interchange Alternative and Throat Area Variations are implemented. The No Build Alternative in this DEIR takes into account various projects likely to be constructed in the area before the 2040 Project design year including the:

- Harvard institutional Master Plan;
- GMCA Line station consolidation project,
- Commonwealth Avenue improvement project (Phase II),
- Cambridge Street Bridge; and
- Green Line consolidation at Packard's Corner/BU Bridge.

In addition, Preferred Alternative 3K, presented in Chapter 3, was developed to ensure that the design will not preclude reasonably foreseeable projects including Urban Rail Service (diesel multiple unit, or DMU service), double tracking of the GJR connection, the Urban Ring Project and overbuild of the station and the layover yard.

EEA-17: The DEIR should describe any modifications to the preferred interchange configuration, 3J, since the filing of the ENF. The DEIR should discuss potential design refinements including, but not limited to, making the East Drive Connector at-grade and elevating Stadium Way Connector and note comparative operational or environmental impact reductions to the configuration presented in the ENF. Additionally, the alternative analysis should explore means to limit roadway elevation changes, while maintaining rail service, to maximize accessibility to West Station and potential north-south connections across the site between the BU area and Cambridge Street and the Charles River.

Response: The 3J eastbound and westbound I-90 ramp connections to the local roadway network were changed so that the eastbound ramp connections occurred at the Seattle Street and Stadium Way Connectors, and the westbound ramp connections occur at East Drive and the West Connector. (i.e. the eastbound and westbound connections at Stadium Way and East Drive were "flipped"). Section 3.1.3 fully describes the design modifications since the ENF filing. Table 5.4-1 presents slope variations between major connector streets for the three Throat Area Variations.

EEA-18: As noted in the ENF, MassDOT should advance three design scenarios for Cambridge Street-Option 3J-1 (Two-Way Cambridge Street); Option 3J-2 (One-Way Parallel) and Option 3J-3 (Two-Way Parallel Street)-modified as necessary based upon adjustments to the interchange alternative (3J) and informed by other project goals and the results of the alternative analyses described below.

Response: Since the ENF, series 3J has been replaced with 3K based on input from the community, the Project Task Force, and the BPDA Placemaking Study, as described in Chapter 3. ENF Option 3J-1 without Cambridge Street South, and Option 3J-2 with Cambridge Street and Cambridge Street South as a one-way pair, have been eliminated from further consideration as a result of continued Project Task Force, City of Boston, landowner and community input.

EEA-19: The DEIR should include an alternatives analysis that explores the feasibility of cantilevering the I-90 viaduct over a realigned SFR. At a minimum, MassDOT should assess a configuration that extends over a portion of a relocated SFR, or a configuration wherein SFR is relocated in its entirety under a new I-90 viaduct.

Response: Appendix M, Evaluation of Soldiers Field Road Relocation under Viaduct Concept, provides an alternatives analysis that addresses the feasibility of cantilevering the I-90 viaduct over a realigned SFR.

EEA-20: For each alternative, the DEIR should include parkway cross-sections, proposed locations of key viaduct superstructure, impacts to rail operations (freight and commuter), future rail, bike, and pedestrian connections across the Grand Junction Railroad bridge, available open space/parkland adjacent to the Charles River, connections or expansion of the Paul Dudley White Bike Path, and potential intersection modifications to accommodate a realigned SFR.

Response: Cross sections of each Throat Area Variation and viaduct superstructure are provided in Section 5.7 and 5.8, and future bike and pedestrian connections across GJR are discussed in Section 5.9. Available open space and parkland, and connections to the Charles River via the PDW Path, are described in Section 4.4 and Section 5.4. Intersection modifications to accommodate a realigned SFR with new eastbound and westbound ramp connections are included in Section 3.1.3. Specific to rail operations, see Section 3.2 and Appendix A, Rail Yard and West Station Alternatives Analysis.

EEA-21: The DEIR should identify in more detail why removal of the viaduct and reconstruction of I-90 at-grade was dismissed as a viable alternative.

Response: Two of the Throat Area Variations evaluated in this DEIR include an I-90 at-grade option.

EEA-22: In concert with this analysis, the DEIR should discuss proposed viaduct cross-section widths, consistency with AASHTO standards, the design implications of seeking design exceptions from the federal highway standards, and how reductions in the viaduct cross-section would impact the cross-section of the at-grade portion of the I-90 interchange. The alternatives analysis should include an alternative based on reconstruction within the current cross-section, noting potential benefits and potential design exceptions for shoulders, lane width, etc. required to achieve this layout. Furthermore, the analysis should consider the implication of alternative design exceptions, not necessarily consistent with the existing cross-section and describe the types and locations of other MassDOT projects with design exceptions and their overall performance with regard to operations and safety. The DEIR should also discuss if requests for design exceptions may impact the fundability or approval of the project by State and federal officials.

Response: For an extensive discussion of viaduct cross section widths and their implications regarding AASHTO design criteria, design exceptions, safety, operational and maintenance benefits and deficiencies, and at-grade comparisons, see all subsections under Section 3.3, Throat Area Variations.

The need for design exceptions on a project does not affect state or federal approval if the need is sufficiently documented by engineering analysis in a Design Exception Report submission and then accepted by MassDOT and FHWA. Subsequent funding of the project is unaffected after the design exception is approved.

Rural segments of the interstate system are typically posted for 65 mph. The portion of I-90 passing through the Allston Project Area currently has a posted speed limit of 50 mph. It will have a reduced urban interstate posted speed of 55 mph at the conclusion of the Project, based on the elimination of limiting curvature at the former toll plaza and moving the current alignment further to the south.

The Big Dig project involved a high concentration of merging and diverging movements in close succession, frontage roads, collector/distributor roadways, tunnels, and multiple level highway and ramp structures, with all connections requiring guide signs and directive instruction that vehicular operators could read, understand and act upon safely. In this constrained space, highway design exceptions were necessarily required. All of these elements together required that the Big Dig operating speed be reduced to reach a level deemed safe enough for drivers to travel through the inferior geometry, and for all maneuvers to be adequately seen, understood and safely executed.

Unlike the Big Dig, the interstate highway located through this Project will be connected to the local community through a total of only four ramps, and the next closest ramp is more than 1 mile to the east. Adequate space is available for advance guide signing and for the merging and diverging operations required within the Project. Width reductions for lanes and shoulders are either not needed or are needed only to a limited extent to meet the Project Purpose and Need. Highway design exceptions are not intended to be explored, but are available to request should they be required in the event that meeting design standards is not feasible or technically possible. See Sections 3.1, 3.3 and 5.8.1.

EEA-23: I note the conceptual designs created as part of the Boston Society of Architect's charrette and comments from stakeholders regarding the creation of an "Allston Esplanade" along the Charles River, facilitated by a relocated SFR. I encourage MassDOT to review these conceptual designs to inform their Preferred Alternative for expanding open space in Allston. Each project alternative should seek to maximize publicly accessible open space to the extent practicable between the BU Bridge and River Street Bridge, given ownership and easement rights, necessary railroad operations, and traffic operations and safety considerations along SFR and other roadways.

Response: The conceptual designs created at the Boston Society of Architect's charrette were part of the impetus to move SFR as far west as feasible to maximize creation of open space adjacent to the Charles River. This proposed shifted alignment of SFR was coordinated with and accepted by Harvard University Beacon Yards, LLC, the land owner of the impacted property. See Section 5.4 and refer to the response to Open Space FAQ 1.

EEA-24: Alternatives should consider how these open spaces can be integrated into the broader system of parks and recreational areas associated with the Charles River, nearby institutions, and the Cities of Boston and Cambridge.

Response: The Project will include separated pedestrian and bicycle paths from the Charles River parklands on the Allston side to River Street, making a safer connection to Cambridge Parks up to the River Street Bridge, and to river-side parklands to the north. Separated sidewalks and protected bicycle lanes across the Project Area, (north to south) on Seattle Street Connector and on Stadium Way, will connect the North Allston Neighborhood with the neighborhood and BU to the south. A sidewalk and a two-way cycle track along the north side of Cambridge Street South will connect the parklands adjacent to the river with neighborhoods to the north and south of the interchange area.

Integration of the proposed open space between SFR and the Charles River to the open spaces on the far bank of the Charles River will be facilitated with the repurposing of the SFR westbound exit ramp to River Street from a vehicular roadway to a landscaped enhancement of the PDW Path. See Graphic 5.4-19. The proposed separated two-way bike lane with sidewalk, on the north side of Cambridge Street South, will directly connect the proposed open space adjacent to the Charles River to the neighborhoods to the west by way of an at-grade bridge overpassing a depressed section of SFR. An added feature of the overpass is its extended deck space for landscaping to gradually integrate the broad spaces on the easterly side of SFR to the street grid to the west. See Graphic 5.4-18.

EEA-25: The DEIR should indicate potential ownership and maintenance responsibilities of these open spaces.

Response: The created open spaces east of SFR and on the landscaped bridge deck over the depressed section of SFR will be owned and maintained by DCR. The open spaces that are integral to the street grid will be within street rights of way (ROWs) and/or easements, maintained by the City of Boston. To date, four of the MCP disposal sites have been closed with Activity and Use Limitations (AULs), which describe constraints and obligations with respect to land use. Each AUL is unique and specific to that location. Other AULs may be placed as additional sites are closed. To the extent any open space is coincident with AUL limits, use of that space will be subject to those AULs. See Section 4.20 and Appendix J, Hazardous Materials Assessment Report, for reference to AULs.

EEA-26: Finally, shifting SFR to expand open spaces may result in improved traffic operations and provide opportunities to reduce the SFR cross-section at other intersections near the Charles River as suggested in comment letters. MassDOT should consider these opportunities when performing the traffic analysis for the project and evaluating open space options.

Response: See the discussion of SFR under the 3K-4 Alternative heading in Section 3.1.3, and numbered paragraphs 1 through 4.

EEA-27: The DEIR should describe the route width, separation of bicycles and pedestrians (if any), conceptual elevations and slopes, and need for bridges or tunnels to reduce conflicts with vehicles or train operations.

Response: For an in-depth discussion of bicycle and pedestrian routes, route sections, and connections see Section 5.7, Pedestrian and Bicycle Facilities. This section describes the PDW Path including design implications associated with each of the three Throat Area alternatives (3K-HV, 3K-AMP, and 3K-ABC), north-south and east-west connections through the Project, a bridged connection over rail at West Station to Malvern Street, a connection to Babcock Street, a bridged connection over SFR between the street grid and the proposed Charles River open space, and the Franklin Street pedestrian and bicycle bridge replacement. In addition, see the paragraphs entitled "Franklin Street Pedestrian Bridge Replacement" (locations 1 through 3) under the heading "3K-4 Modifications" in Section 3.1.3 for an in-depth discussion of the three alternative Franklin Street bridge locations and concepts.

EEA-28: The DEIR should conduct an alternatives analysis that focuses on key bicycle and pedestrian routes including:

- Crossing SFR to the Paul Dudley White Bike Path (including connections to potential bicycle/pedestrian access across the Grand Junction Railroad);
- Connections north to south across the site (Commonwealth Avenue area to North Allston and SFR); and
- A dedicated corridor from west to east (the "People's Pike).

Response: See Section 3.1 and Section 5.7. The design and siting for this dedicated separated bicycle facility on the north side of Cambridge Street South responds to the advocates of the People's Pike. The design follows the criteria established in MassDOT's *Separated Bike Lane Planning and Design Guide* (2015). Secretary Pollack's introductory letter within the Guide states that it builds on MassDOT's Complete Streets initiative, the GreenDOT Policy Initiative, and the Healthy Transportation Policy Directive to ensure that MassDOT projects increase and encourage bicycle trips. Key members of the Project Team that produced the guide included representatives from WalkBoston, MassBike and the LiveableStreets Alliance. Federal guidance for separated bicycle facilities has been adopted by MassDOT and is presented in FHWA's *Separated Bike Lane Planning and Design Guide* (2015), which is based on national best practices.

EEA-29: The analysis should discuss how the routes will be integrated with one another and create a safe environment for pedestrians and bicyclists alike.

Response: Refer to the response under EEA-27. The graphics within the referenced sections illustrate how the separated bicycle facilities and sidewalks are integrated within the Project Area. Intersection illustrations are included to show how these facilities are safely accommodated where vehicular movements cross these routes.

EEA-30: The analysis should consider varying locations for the bridge span over a relocated SFR, design parameters, and minimizing direct parkland impacts associated with conceptually designed ramps and footings.

Response: The design presented in this DEIR now includes an at-grade connection between Cambridge Street South and the Charles River instead of an elevated pedestrian bridge. This proposed at-grade bicycle/pedestrian structure over a depressed SFR section will favor pedestrians and bicyclists. A widened bicycle/pedestrian structure over SFR is proposed in order to also accommodate planting on the structure. See Chapter 3 and Section 5.7.

EEA-31: The DEIR should address required easement rights for portions of these facilities that may be located on land owned by Harvard University.

Response: Harvard University supports the street grid layout, SFR alignment and location of the bridge over the depressed section of SFR. New City of Boston and DCR roadways will be rights of way (in fee) takings, as negotiated with Harvard.

EEA-32: It should identify how alternative designs retain a feasible connection to the Grand Junction Railroad bridge (e.g., provide available area for a multi-use path on the eastbound side of SFR, etc.).

Response: With the proposed depressed section of SFR, the bicycle and pedestrian connection between the proposed street grid and the PDW Path will become significantly more attractive and more accessible to all skill levels of cyclists, due to the elimination and replacement of elevated ramps over SFR with a level bridge crossing. By enhancing this route, a future connection to the GJR Bridge should be on the easterly side of SFR (the westbound side), not the westerly side (the eastbound side). On the easterly side, the area just to the west of the existing embankment of the GJR Bridge approach will be sufficient to construct a switchback ramp connector from the PDW Path to the GJR Bridge surface. See Section 5.7 and Section 5.9.

EEA-33: The DEIR should identify opportunities to expand the width of the Paul Dudley White Bike Path within the project area based upon the configuration of the relocated SFR and I-90 viaduct placement.

Response: For both the 3K-HV and 3K-AMP Throat Area Variations, the existing 8.5-foot-wide path will be increased to a minimum of 12-feet-wide and include separated pedestrian and bicycles paths in the larger open spaces along the entire length of the new path. For the 3K-ABC Variation, the path will be constrained to 8.5 feet wide for a distance of approximately 500 feet in the Throat Area.

EEA-34: MassDOT should evaluate bicycle and pedestrian routes that traverse the West Station and BPY layover facilities to create connections between the Commonwealth Avenue/BU area and SFR, as well as connections to bicycle and pedestrian routes to the North Allston neighborhood and Harvard University. The route through and/or over West Station and BPY layover facilities should be accessible at all times and not limited to MBTA operational hours. The DEIR should describe how this route may connect to other portions of the existing and proposed pedestrian and bicycle network to reach destinations in North Allston, including Harvard University and Western Avenue. Conceptual designs for this potential connection should include cross-sections depicting elevation and grade changes to facilitate crossing over the BPY layover facility and railroad tracks.

Response: Multiple potential bicycle and pedestrian routes were investigated during preliminary Project design. Bicycle and pedestrian routes were advanced based on proximity to the future consolidated Green Line Station locations and north-south desire lines. Connections that provide multimodal use and minimize switchbacks were preferred. Input from both BU and Harvard University was sought, with emphasis on safety and continuity of the connections. Selected pedestrian connections were designed to allow for use of the pathways during all hours, even while the station is closed, and access ways that traverse the West Station and BPY. A description of bicycle and pedestrian access within and through the station for the 2025 opening year is provided in Section 5.7.2 and for the 2040 design year in Section 5.7.3.

EEA-35: Numerous comments highlight a desire for a dedicated bicycle and pedestrian corridor (the People's Pike) connecting North Allston neighborhoods (near the Lincoln Street/Cambridge Street intersection) to SFR and the proposed bridge crossing to the Paul Dudley White Bike Path. MassDOT should continue to evaluate this project feature and advance design alternatives with varying routes, cross-section widths, separation of bicycle and pedestrian uses, and landscaping buffers to determine the most effective way to integrate this multi-modal element into the overall project design. This analysis should seek to design the path in a manner that prioritizes bicycle and pedestrian modes of travel (e.g., separate bicycle signals, etc.) for all user types and limits conflicts with vehicles (particularly at intersection locations).

Response: The proposed depression of a section of SFR and the construction of a landscaped, level, at-grade overpassing deck will provide a singular, unifying community connective feature between the proposed open space at the Charles River and the neighborhoods to the west and south. The overpassing deck will align with Cambridge Street South. Specifically, the two-way separated bike path and sidewalk on the northerly side of the street will line up with the landscaped corridor on the bridge deck, and continue into the open space along the river.

The centrally located facility will be ideally aligned and positioned for these new community connections. Within the proposed street grid, the signalized intersections will be designed with continuing separated geometry and operating features for an enhanced bicycle and pedestrian route.

The design and siting for this dedicated separated bicycle facility on the north side of Cambridge Street South responds to the advocates of the People's Pike. The design follows the criteria established in MassDOT's *Separated Bike Lane Planning and Design Guide* (2015). Secretary Pollack's introductory letter within the Guide states that it builds on MassDOT's Complete Streets initiative, the GreenDOT Policy Initiative, and the Healthy Transportation Policy Directive to ensure that MassDOT projects increase and encourage bicycle trips. Key members of the project team that produced the Guide included representatives from WalkBoston, MassBike and the LiveableStreets Alliance. Federal guidance for separated bicycle facilities has been adopted by MassDOT and is presented in FHWA's *Separated Bike Lane Planning and Design Guide* (2015), which is based on national best practices.

EEA-36: As part of the DEIR, I encourage MassDOT to consider additional ways to reduce impacts to environmental resources through design modification or the addition of features to further mitigate potential impacts. Additional recommendations provided in this Certificate may result in a modified design that enhances the project's ability to avoid, minimize, or mitigate Damage to the Environment. The DEIR should discuss steps MassDOT has taken to further reduce the impacts of the project since the filing of the ENF, or, if certain measures are infeasible, the DEIR should discuss why these measures will not be adopted.

Response: The 3K-HV Variation in the Throat Area is the least environmentally damaging variation with respect to direct alterations to wetland and historic resources, while meeting interstate highway design standards. Since the filing of the ENF, SFR to the west of the Throat Area has shifted significantly west, away from the Charles River. In addition, by proposing a ramp connection from SFR westbound to the proposed street grid, the existing SFR ramp to River Street will be abandoned to vehicular traffic and converted to open space use for an expanded PDW Path.

In terms of impacts to wetlands and waterways resources, the 3K-ABC Variation will result in impacts to the Charles River and flowed tidelands from the placement of a retaining wall and associated fill, while the 3K-HV and 3K-AMP Variations will result in impacts limited to the buffer zone to Bank and Filled Tidelands only. Table 1.2-1 provides a summary of environmental factors that differentiate the Throat Area Variations.

EEA-37: Therefore, it is imperative that MassDOT, Harvard University, the City of Boston and relevant stakeholders work together in advance of preparation of the DEIR to establish future land use development assumptions. These assumptions will be critical to inform the 2035 future build traffic analysis, air quality analysis, and ongoing Commonwealth efforts to meet travel mode shift goals and GHG emissions mitigation. These design assumptions should be clearly stated in the DEIR and note key planning features such as, but not limited to, density (floor-to area ratios (FAR)), heights, block size, open space, parking ratios, and accommodations for features that enhance multi-modal access. Design assumptions should reflect a context-sensitive design that addresses the potential transition from the predominately single-family and two family housing in North Allston to mixed-use commercial/office/retail/institutional spaces in this potential development area.

Response: See Section 5.2.2 for future land ownership and use assumptions.

EEA-38: The DEIR should discuss opportunities to deck over the BPY layover facility and West Station to facilitate future air rights development by Harvard University. It is unclear when Harvard University may choose to exercise its development rights in this location. As such, the DEIR should describe how the BPY layover and West Station facilities may be constructed to accommodate support structures and decking in the future. The DEIR should discuss the benefits and challenges of constructing decking concurrent with, or after completion, of the I-90 project, development cost implications (present and future), opportunities for public/private partnerships, and potential constraints on MassDOT rail operations.

Response: See response to EEA-7 and the Future Development/Decking/Utilities FAQ.

EEA-39: The DEIR should include a description of how the project will alter land uses or require the relocation or accommodation of existing uses. The DEIR should provide conceptual estimates of earth removal and/or fill to achieve the grades proposed as part of the Preferred Alternative. Based upon these estimates, MassDOT should indicate whether a net import or export fill condition is anticipated and how potentially contaminated soils will be excavated, stored and disposed.

Response: The Project will remove material associated with access to land that was used exclusively for transportation-related operations, including interstate highway, interstate ramp connections, toll support infrastructure, rail freight loading and off-loading to trucks, rail equipment maintenance and rail travel. Future use will be dependent on land owner planning. The conceptually estimated volumes of soil excavation (cut) and fill are, at 500,000 and 300,000 cubic yards, respectively, depending on the Throat Area Variations, but the availability of soil from the excavation operation for reuse as fill will be dependent on construction staging.

A balanced removal of existing embankments for immediate re-use elsewhere in the Project will not be possible due to construction staging. As a result, the Project will need to import fill material, and at the end of the Project, excess soil will need to be removed. The volume of soils destined for permanent off-site disposition will be heavily dependent on construction sequencing and re-use opportunities, and will be evaluated in construction staging during final design. All export soils will be managed in accordance with applicable regulations and policies. See Section 5.2.0.

EEA-40: I encourage MassDOT to limit elevation changes and transition area as feasible throughout the site to facilitate non-vehicular modes of transit to and through the project site, utility locations, and maximize future development potential for Harvard University.

Response: Additional alternatives were developed since the publication of the ENF. Specifically, in order to lower the roadway profile and reconfigure key intersections, Preferred Alternative 3K was developed and analyzed. This alternative was developed at the request of Harvard University. This alternative is discussed in Chapter 3. Elevation changes are discussed in Section 5.3 and illustrated in Section 3.1.3.

EEA-41: Project components may result in direct impacts to land held in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth (Article 97 land) and/or easement rights. The DEIR should identify the extent and boundaries of Article 97 land and easements, the potential amount and location of parkland impact, and how the project seeks to minimize impacts to these designated open spaces. In conjunction with the alternatives analysis for the relocation of SFR, viaduct reconstruction, and potential expansion of open spaces along the Charles River, MassDOT should evaluate compliance with the provisions of the Section 4(f) requirements (including shadow and noise impacts), the requirements of Article 97 legislation and Executive Office of Energy and Environmental Affairs' (EEA) Article 97 Land Disposition Policy.

Response: Section 5.4.5 includes an evaluation of impacts to Section 4(f) parkland and Section 5.4.6 assesses impacts to Article 97 Lands. Section 5.4 describes the expansion of parkland along the Charles River. Shadow impacts are described in Section 5.4.5 and Appendix K, Shadow Study. Noise impacts are discussed in Section 5.11. Figure 4.4-1 shows existing DCR Public Parkland, Section 4(f) and Article 97 Land. Figures 5.4-1 through 5.4-9 show Section 4(f)/Article 97 Land impacts and new parkland/open space.

EEA-42: The DEIR should identify the extent and location of potential private property takings based on the conceptual design for the new pedestrian bridge over I-90 near Franklin and Lincoln Streets. I encourage MassDOT to meet with landowners prior to preparation of the DEIR to discuss potential project-related impacts.

Response: Acquisition of the former Ace Ticket building and a portion of the Regina Pizzeria overflow parking lot for the new pedestrian bridge over I-90 is anticipated. In other locations, property acquisition from BU may be required, depending on the Throat Area Variation. Property rights will be required from BU for the Babcock Street pedestrian connection (owned by BU). Additional property rights from BU may be required for Throat Variation 3K-AMP. Property acquisition at 76 Ashford Street for the pedestrian/bicycle connection will be required. Driveway access at 400 SFR (Hilton Double Tree Suites) from Cambridge Street will be altered, as well as access to Houghton Chemical Corporation. See Section 5.2 and Section 5.7 for acquisitions associated with the pedestrian access.

EEA-43: The DEIR should include a Traffic Impact and Access Study (TIAS) prepared in accordance with EEA/MassDOT Guidelines for EIR/EIS Traffic Impact Assessments. As noted in the ENF, the TIAS will examine existing and future 2020 and 2035 No Build and Build alternative transportation conditions. The TIAS should use data and methodologies provided through collaborative efforts with CTPS), BTD, the City of Cambridge, Harvard University and BU to identify study area intersections, mode-split data, and data forecasting. The TIAS should discuss existing and proposed traffic volumes and conditions, anticipated trip generation rates across all modes (vehicles, pedestrians, bus, rail, etc.), crash rate data, level-of-service (LOS) operations at signalized and unsignalized intersections, public and private parking, proposed access points to West Station and the BPY layover facilities (staff and deliveries only), and consistency with State policy goals. Consideration should be given to truck traffic distribution within the study area due to use restrictions on SFR.

Response: Truck traffic forecasts for 2025 and 2040 were included in the CTPS modeling of future No Build and Build Alternatives. See Section 4.8.1, Section 5.8.2, and Appendix C, Traffic Operations Study.

EEA-44: The TIAS should also include a draft transportation monitoring protocol for implementation by MassDOT. This monitoring plan should include, but not be limited to, an evaluation of intersection operations, and bicycle, pedestrian, and transit mode shares.

Response: Traffic monitoring equipment will be incorporated into the Project design. This will allow MassDOT and the BTD to monitor volumes and operations in the interchange area. A Transportation Demand Management (TDM) program that monitors mode share levels at the BPY will be the responsibility of the land owner/developer (Harvard University). The specific elements of the Harvard TDM program will be identified in the Transportation Access Plan Agreement (TAPA) negotiated with the BTD and Section 61 Findings negotiated with MassDOT. See Section 7.8.

EEA-45: The TIAS should include average and 95th percentile queuing data for each intersection, with a particular focus on the proposed series of signalized intersections along Cambridge Street to ensure that lengthy queues will not form potential blocking intersections.

Response: See Appendix C, Traffic Operations Study, Technical Appendices C-3 and C-4.

EEA-46: Existing or future anticipated "No Access" limitations on the ramps and street network should be described and identified in the DEIR, with a focus on limiting these restrictions.

Response: No access lines are limited to the interstate and interstate ramps. The street network, including Cambridge Street South and all streets to the north of it, will be City of Boston streets potentially subject to Harvard easement restrictions. MassDOT retains control and operation of traffic signals first encountered at exit ramps and last encountered before entering the interstate. The proposed limits of the MassDOT "No Access Line" are south of Cambridge Street South, along the east and west sides of north-south connector roads, and along the eastbound and westbound ramps systems. See Figure 5.2-1.

EEA-47: Assumptions regarding future transit operations should be clearly identified in the DEIR to justify proposed ridership data in 2020 and 2035. The DEIR should analyze impacts on ridership (positive and negative) to connecting subway and bus routes, most notably the Green Line's B Branch.

Response: MassDOT, in conjunction with CTPS, developed ridership projections for the 2025 and 2040 Build Out conditions. Details on the proposed ridership from West Station and the area transit assumptions are provided in Section 5.9 and Appendix L, Ridership Forecasting Technical Report.

EEA-48: The DEIR should describe anticipated modifications to the existing roadway network, including physical modifications to the State Highway Layout, DCR roadways, and City of Boston or City of Cambridge streets.

Response: See Section 5.2, Section 5.8 and Figure 5.2-1.

EEA-49: The DEIR should indicate whether the proposed urban street grid generally located south of Cambridge Street will be public or private roadways.

Response: See Section 5.2.2.2., Section 5.8 and Figure 5.2-1.

EEA-50: The DEIR should include conceptual drawings depicting these required modifications to demonstrate their feasibility and overall integration into the roadway network. Roadway cross sections and plans identifying proposed road, bicycle accommodation, and sidewalk widths, utility corridors, lane striping and assignment (e.g., left-tum only, etc.) should be provided at a legible scale.

Response: Section 5.8 provides cross sections, including roadways and sidewalk widths. Figures 5.18-1 through 5.18-3 show various utilities in relation to the Preferred Alternative 3K and the Throat Area Variations. Figures in Chapter 3 provide the Preferred Alternative schematic renderings and cross sections. The Throat Area Variations are discussed and illustrated in Section 5.4.4.

EEA-51: To assist in review, the DEIR should also provide cross-sectional renderings of the project depicting elevation changes and the relationship of various project elements to elevated structures (e.g., bridge access to West Station, I-90 viaduct to SFR, etc.).

Response: See Sections 5.2 through 5.4 for slope and height information for north/south connectors and bridge access. See Section 5.4 and Section 5.8 for I-90 viaduct and SFR, Section 5.7 for Bicycle and Pedestrian connections, and Section 5.9 for West Station.

EEA-52: Finally, graphics should be included identifying typical travel routes to and from key destinations given the proposed new traffic patterns and roadways (e.g., Masspike [sic] eastbound to Memorial Drive; Western Ave to West Station, etc.).

Response: A combination of tables, charts and figures were prepared to augment the text describing traffic patterns and the origins and destinations of interchange users for the Existing, 2040 No Build, 2040 Build and 2040 Build with Commonwealth Avenue Connection analysis scenarios. See Appendix C, Traffic Operation Study. Figures in Chapter 3 provide conceptual design plans illustrating roadway locations and connections.

EEA-53: The DEIR should include a discussion of background infrastructure projects assumed to be in place in the 2020 and 2035 Build Condition and how they may affect proposed interchange modifications.

Response: The CTPS Technical Memorandum in Appendix C, Traffic Operations Study (C-2) includes a list of highway and transit projects assumed in the modeling for the 2025 and 2040 analysis years.

EEA-54: In particular, the DEIR should discuss proposed interim improvements to Cambridge Street by the City of Boston and proposed River and Western bridges improvements by MassDOT. The DEIR should discuss the design and construction status and how these projects would be advanced separately, or in conjunction with the project, or will be consistent with proposed interchange improvements. Cycling and pedestrian accommodations for these two projects should make logical connections to the I-90 project to ensure continuity.

Response: Interim improvements on Cambridge Street include bicycle lane markings and bridge deck re-allocation from vehicular to bicycle/pedestrian uses on the bridge over I-90. The schedule for the bicycle and pedestrian improvements planned at the River Street and Western Avenue bridges are currently indefinite, but it is anticipated that these improvement will be applied to the Project. See Section 5.7.1 for a description of the bicycling and pedestrian improvements.

EEA-55: The ENF indicated that Stadium Way and East Drive will be constructed by Harvard University. The DEIR should include a comparative analysis of study area traffic operations (vehicle, bicycle, pedestrian) if Stadium Way and East Drive are not completed prior to the projected I-90 project opening date of 2020 with these two roadways being constructed and operational.

Response: The 2025 Opening Year analysis does not assume Stadium Way or Cattle Drive will be built by Harvard University, but does assume construction of East Drive by Harvard (north of the North Connector). See Section 5.8.2.2 and Figure 5.8-1.

EEA-56: The project proposes two new ramps affecting SFR, an off-ramp from the eastbound side of the SFR north of Cambridge Street and an on-ramp to SFR eastbound south of Cambridge Street. The TIAS should specifically address project-related impacts to SFR mainline operations at these new on- and off-ramp locations.

Response: The Project proposes to relocate the existing westbound off-ramp to Cambridge Street to a location approximately 1,500 feet south. A new eastbound on ramp will also be constructed at this new location. The existing eastbound on-ramp from Cambridge Street will be retained, however, the on-ramp volume will be dramatically reduced because of the new ramp (less than 100 vehicles in the AM peak and less than 150 vehicle in the PM peak). Additionally, the existing eastbound merge area will be enhanced geometrically to improve safety and operations of the merge. Therefore, with the combination of low volumes and improved geometry, it is anticipated that operations along this segment of SFR will not be adversely affected.

EEA-57: Numerous comments requested that the project be expanded to include a vehicular connection from West Station to Commonwealth Avenue. The DEIR should analyze the feasibility of such a connection including the potential impacts and benefits, including environmental impacts, traffic distribution and LOS, transit connection improvements, grading and elevation challenges, land takings to accommodate roadways or bridge abutments to span the commuter rail tracks, and impacts on railroad operations.

Response: MassDOT studied the benefits and impacts of providing a new roadway connection between Commonwealth Avenue and Cambridge Street. Two options were evaluated: (1) a connection open to all traffic; and (2) a connection limited to buses only. Although construction of this connection is not included as part of the Project, the Project will be designed in order to accommodate this roadway connection in the future should others wish to pursue it. A summary of the evaluation is provided in Section 5.8.2.4. Detailed results are provided in Appendix C, Traffic Operations Study.

EEA-58: The DEIR should evaluate and provide a comparative analysis of LOS, queuing, and safety benefits or challenges associated with each interchange scenario evaluated in the DEIR. These data should be weighed in conjunction with urban redevelopment and expanded multimodal access to select a preferred interchange alternative.

Response: LOS data for the I-90 mainline, I-90 ramp junctions and ramp/local roadway intersections for each of the future interchange alternatives evaluated (2040 No Build, 2025 Build, 2040 Build, and 2040 Build with Commonwealth Avenue Connection) are provided in tables and figures in Section 5.8.2 and in the Traffic Operations Study in Appendix C. Detailed LOS and queuing data for these alternatives can also be found Appendix C. Section 5.8.2 discusses the Commonwealth Avenue Connection Alternative and Appendix C, Traffic Operations Study, also includes a side-by-side LOS comparison table of this alternative with the 2040 Base Interchange Alternative (3K-HV Variation).

EEA-59: The DEIR should identify any potential changes to LOS, queuing or safety along the I-90 viaduct between a cross-section that meets AASHTO standards and studied alternatives that implement design exceptions (i.e., limited shoulders, etc.).

Response: From strictly a highway LOS perspective, there are only minor differences between the three Throat Area Variations on the I-90 viaduct. However, there will be safety impacts associated with providing lane and shoulder widths that will be less than the AASHTO standards. These LOS differences are discussed in Section 5.8.1.

EEA-60: The DEIR should describe how the selected viaduct and interchange improvements will impact the reverse/U-turn directional loop ramp to travel from I-90 westbound to I-90 eastbound traffic movement.

Response: The existing U-turn function will be available with the Preferred Alternative 3K. This maneuver will require drivers to go through three traffic signals. Appropriate signage will be developed during the design phase to guide westbound drivers through the interchange to reverse direction.

EEA-61: The DEIR should include a conceptual station design for West Station, based upon anticipated future ridership and operations (2020 and 2035), that effectively integrates and connects the station to the existing and proposed future layout of the surrounding area.

Response: Conceptual station layouts are included in Chapter 3, Section 5.3.4 and Section 5.9. West Station will provide multimodal access to the neighborhood while promoting economic development of the surrounding parcels. The station design will accommodate various modes of transportation, including bus, rail, pedestrian and bicycle connections to the surrounding areas. The design reflects anticipated future operating assumptions and the ridership projections prepared by CTPS, which are described in Section 5.9.3.1 and Appendix L, Ridership Forecasting Technical Report.

EEA-62: The DEIR should justify MassDOT's selected location for the station based on operational efficiencies and minimization of environmental impacts (e.g., noise and vibration, etc.) and describe how this location will maximize neighborhood connections and ridership.

Response: The DEIR includes an Alternatives Analysis for the station that considers proposed operations, environmental constraints and proximity to surrounding neighborhoods. A noise and vibration analysis was conducted to ensure that Preferred Alternative 3K complies with all local, state and federal requirements. See Section 5.9 for operations and constraints and Section 5.11 for noise and vibration impacts.

EEA-63: The DEIR should include a timetable for West Station operations (both commuter and rail service).

Response: Anticipated future operating assumptions at West Station, including Worcester Main Line commuter rail and shuttle bus passenger operations, are described in Section 5.9 and Appendix L, Ridership Forecasting Technical Report.

EEA-64: Conceptual layout plans for West Station should be provided at a legible scale depicting proposed platform lengths and location; elevator and stair access to the platforms; pedestrian and bicycle access points; bicycle parking or bike share accommodations; conceptual mezzanine dimensions, location and elevation cross-sections; sheltered amenity space (i.e., Charlie Card machines, waiting areas, etc.); and proposed shuttle and taxi accommodations, bus berths and "kiss-and-ride" drop-off/pick-up locations.

Response: Conceptual layouts for West Station are provided in Section 3.2.2 and Section 5.9.

EEA-65: The DEIR should also discuss how the proposed station design is consistent with Harvard University's desire to optimize the potential for future air rights development that is both technically feasible and economically viable.

Response: See Response to EEA-7 and FAQ Future Development/Decking/Utilities.

EEA-66: Multi-modal connections to West Station are critical to ensuring maximum use and forwarding the Commonwealth's mode share goals. The DEIR should include a circulation plan depicting proposed access routes for pedestrians, bicycles, transit vehicles, taxis/shuttles, and private vehicles to and from West Station.

Response: A multimodal circulation plan was incorporated into the Project. Bicycle and pedestrian access to West Station from the north and south will be provided prior to the construction of the station and when the station is open or in use. Specifically, a 12-foot-wide bicycle and pedestrian bridge will be constructed to connect Malvern Street to the south with the proposed street network to the north across the Worcester Main Line, rail yard and realigned highway. In the 2025 Opening Year, the proposed station will not yet be constructed.

In the 2040 Design Year, West Station will be constructed as a multi-modal station serving pedestrians, cyclists, vehicles, taxis, buses and commuter trains. The proposed station will provide direct pedestrian connections to the north and south. Bicycle and pedestrian access to the station from the south will be provided through a modified Malvern Street Bridge and a ramp or stair and elevator access way from Babcock Street. The Malvern Street Bridge will maintain the original alignment, but connect to the bus loop level of the station. The retained alignment will allow cyclists and pedestrians to use the bridge to cross the Worcester Main Line, rail yard and I-90 highway at any time of day, without needing to enter the station area. Bicycle and pedestrian access to the station from the north will be provided through the sidewalk and roadway network connections for the bus loop. Refer to Sections 5.7 for pedestrian connections.

EEA-67: The DEIR should include an analysis of current bus routes and how they may be altered to provide direct connections to other bus routes or commuter rail service at West Station. The DEIR should evaluate how the West Station design and access loop will provide adequate capacity for future transit and shuttle vehicles based upon future ridership estimates for the facility.

Response: The operational needs of the MBTA and intercity buses were incorporated into the design of the station and bus concourse configuration. The vehicle access loop will be designed to provide adequate capacity of future transit and shuttle vehicles and also provide dedicated curb space for MBTA operations. See Section 5.9.3, Ridership and Transit Capacity. The bus concourse elements are described further in Section 3.2. The CTPS modeling for the Design Year (2040) Build scenarios assume minor re-routing of existing MBTA Bus Routes 64 and 66, and the addition of three new "shuttle" routes to/from West Station. See Sections 4.8.2 and 5.9.2.

EEA-68: The DEIR should include a feasibility analysis of a two-way bus/shuttle loop and/or use of bus priority lanes or signalization to facilitate bus access in and out of the station.

Response: West Station includes a two-way bus loop. See Section 3.2.2.

EEA-69: The DEIR should identify the location of "kiss-and-ride" accommodations. If a vehicular drop-off/pick-up location is not located on the south side West Station (near Ashford/Malvern/Babcock Streets), the DEIR should discuss how a lack of a formalized drop-off/pick- up area in this location may impact ridership and traffic patterns and congestion within the neighborhood.

Response: "Kiss and Ride" accommodations are included in the station design to the north, as part of the bus loop concourse design. See Section 5.9.2. A "Kiss and Ride" is not proposed from the south due to restricted space available in this neighborhood.

EEA-70: Furthermore, as no commuter parking is proposed at West Station, MassDOT should describe existing or potential parking control measures that may be implemented to mitigate commuter parking on neighborhood streets.

Response: There is currently metered parking on most of the surrounding streets within the BU West Campus Area (e.g. Ashford, Malvern, and Gardner Streets). There are also residential parking restrictions within the surrounding neighborhood streets (e.g. Ashford Street-west, Hartley Terrace, Wadsworth Street). Additional signage and time restrictions may be utilized to help deter commuter parking. MassDOT will work with the City of Boston to develop and implement parking control measures as needed.

EEA-71: The DEIR should conceptually describe the extent and type of multi-modal features or streetscape improvements along proposed station connections from the Commonwealth Avenue area (i.e., Malvern Street, Babcock Streets, etc.), through connections from the station to the Paul Dudley White Bike Path, and the elevated connector bridge from the Cambridge Street area to create an accommodating, pleasant, and safe access route to West Station. These connections to Commonwealth Avenue, Cambridge Street or other thoroughfares should be designed consistent with adjacent streetscape design and urban context.

Response: Where existing ROW is limited and property acquisitions will be required, an effort was made to reduce the impact by designing the sections to the minimum extent practicable with no additional amenities (Malvern Street and Babcock Street). However, as described in Chapter 3, amenities for pedestrians and bicyclists are proposed throughout the proposed street grid, but to the most significant extent on the primary corridors such as Cambridge Street and Cambridge Street South. Refer to Sections 5.3.3 and 5.4.

EEA-72: The DEIR should discuss how construction and operation of the West Station commuter rail station and proposed use of the BPY layover site will be designed to preserve alternatives for future projects (such as potential DMU service to Kendall Station), anticipated future Amtrak service in the year 2035, potential bicycle and pedestrian connections using the Grand Junction Railroad bridge, and existing freight service. The DEIR should describe these future projects, note their planning and funding status, and discuss design assumptions used to complete the assessment.

Response: Section 5.9 and Appendix A, Rail Yard and West Station Alternatives Analysis, discuss the proposed West Station and use of the BPY layover facility, including accommodation of anticipated future Amtrak and commuter rail passenger services, and existing freight services. Additionally, the design of West Station and the BPY layover site will not preclude potential usage of the GJR ROW. DMU service, although not currently programmed, was also considered in Project development to ensure that operations would not preclude future DMU service in this location. Consistency and coordination with other future projects are described at Section 5.9.

EEA-73: The DEIR should describe anticipated commuter rail ridership in 2020 and 2035 at West Station and include an analysis of how the predicted increases in rail ridership and changes to operations may impact existing and future capacity on MBTA commuter rail, subway and bus routes.

Response: Commuter rail ridership projections at West Station for the 2025 Opening Year and 2040 Design Year are described in Section 5.9.3. An analysis of potential impacts of the ridership forecasts on the future capacity of the MBTA's commuter rail, rapid transit, and on local bus routes operating in the vicinity of the Project, is presented in Section 5.9.4.

EEA-74: I note comments from ABC identifying proposed alignments for the Locally Preferred Alternative of the Urban Ring Bus Rapid Transit (BRT) Route 6 crossing the project site. The DEIR should discuss the design and funding status of the Urban Ring project and how the proposed I-90 project can accommodate and/or, at a minimum, not preclude potential implementation of this project.

Response: MassDOT suspended active planning for Phase 2 of the Urban Ring Project in 2010. However, the Project will not preclude an Urban Ring connection through the interchange area. If pursued in the future, the connection would need to be made via Malvern Street due to grade and interchange connectivity requirements.

EEA-75: The DEIR should describe existing rail operations, ownership and legal rights within BPY, including use of sidings and the Grand Junction Railroad. The DEIR should discuss freight and commuter rail services, frequency of use, types of trains, and connections between rail lines within or approaching BPY.

Response: Section 4.9 includes descriptions of the existing freight and commuter rail operations, rights and usage through the West Station and BPY. These existing rail operations include CSX freight, Amtrak Shore Limited service and commuter rail services. CSX previously owned and operated BPY but sold its rights and property. CSX moved its facilities and operation to central Massachusetts.

MassDOT and the MBTA have operating and easement rights within the Project Area. The rights include nine total tracks: two are designated for mainline use, and seven are designated for yard/storage activities and remain from the previous owner. All other tracks have been removed from the yard area. MBTA operations include the Framingham/Worcester Main Line services operating on the two Main Line tracks, which are comprised of 20 inbound and 20 outbound trips on weekdays, and nine inbound and nine outbound trips on weekends. Non-revenue operations include maintenance movements approximately once a week across the GJR to have south side equipment access the heavy maintenance facility Boston Engine Terminal (BET) in Somerville.

Alternative layouts for BPY were developed with consideration of future DMU service, continued freight service, and future potential use of two tracks over GJR. The DEIR includes more detailed descriptions of the existing freight and commuter rail operations and their usage through the West Station and BPY. Rail operations, ownership and legal rights within BPY are described further in Section 5.9.

EEA-76: The DEIR should discuss the feasibility of alternative locations or changes in elevation of the railroad tracks to facilitate project construction and operations.

Response: Section 5.9 discusses the track elevation changes and associated operations. The elevation of the tracks is constrained by connections to GJR and the Boston Landing Station, structure elevation of Commonwealth Avenue, and existing drainage structures within the station area. Appendix A, Rail Yard and West Station Alternatives Analysis, provides further detail on track elevation changes.

EEA-77: The DEIR should discuss the current condition, ownership and use of spur sidings connecting BPY to areas north of Cambridge Street. The DEIR should indicate whether these sidings will be retained in the final design configuration, or if they are to be abandoned, discuss the protocol and permitting requirements to do so.

Response: The DEIR includes a description of the existing rail infrastructure and operations connecting to BPY. An agreement between Houghton Chemical, Harvard University and CSX will lead to a discontinuation of rail services and the associated spur track to the Houghton Chemical site by spring 2019. The DEIR includes a description of the existing rail infrastructure and operations connecting to BPY in Section 4.9. All sidings splitting to the north of Cambridge Street will be abandoned.

EEA-78: The DEIR should also describe the current condition, ownership and use of the rail connection to the Houghton Chemical Company. For each alternative investigated in the DEIR, MassDOT should indicate whether this connection will be retained in place, relocated, or abandoned. The DEIR should discuss the legal and permitting ramifications of relocating or abandoning this rail connection, if necessary, on continuing operations for Houghton Chemical Company.

Response: Section 4.9 includes a description of the existing rail infrastructure and operations connecting to BPY. An agreement between Houghton Chemical, Harvard University and CSX will lead to a discontinuation of rail services and the associated spur track to the Houghton Chemical site by spring 2019.

EEA-79: The DEIR should contain a description of existing and proposed bicycle accommodations within the study area including their location, type, width, and routes between key destinations. Supporting graphics depicting proposed roadway cross-sections and routes should be included in the DEIR to facilitate review. As noted previously, the DEIR should explore additional route and cross-section alternatives in conjunction with design advancement of bicycle and pedestrian facilities within the Study Area.

Response: Section 4.7 and Figures 4.7-1 and 4.7-2 describe existing bicycle and pedestrian connections in the Project Area. Section 5.7 and Figure 5.7-1 shows the proposed bicycle and pedestrian connections associated with the Project. Multiple shared-use path alternatives will provide pedestrian and bicycle accommodations to and from the south side of West Station to the Project Area. These accommodations will include connections from Malvern and Babcock Streets, which are both logical connection points as they each are continuations of the existing streets.

EEA-80: The DEIR should analyze the potential operational and construction period noise impacts associated with the relocation of I-90, West Station and the BPY layover facility (operations and maintenance activities). The DEIR should include the results of a noise and vibration impact analysis performed in compliance with the MassDOT Noise Policy, the Federal Highway Administration (FHWA) *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, and the Federal Transit Administration (FTA) *Transit Noise and Vibration Impact Assessment Manual.* MassDOT will conduct a noise and vibration monitoring program to establish ambient background noise levels within the project area and proposed layover facility location to develop the project criteria noise limits using applicable guidelines.

Response: MassDOT conducted a noise and vibration assessment to analyze the potential impacts associated with the improvements to I-90 and the introduction of West Station and the BPY layover facility. The assessment followed MassDOT highway noise abatement policies and procedures that implement the FHWA Procedures for Abatement of Highway Traffic Noise and Construction Noise, and the procedures outlined in the FTA's Transit Noise and Vibration Impact Assessment guidance manual. Noise associated with construction activities was assessed according to FTA and FHWA guidelines and local noise ordinances. Section 4.11 discusses existing noise; Section 5.11 discusses Project noise and vibration impacts, and Section 7.11 provides mitigation for noise impacts. In addition, Appendix H, Noise and Vibration Analysis, provides a detailed analysis of the Project noise impacts.

Mitigation measures will be included in select locations, as warranted, based on the Noise Study, which takes into account levels at various locations within and adjacent to the Project vicinity. The benefits of using noise walls with absorptive surfaces or transparent panels was included in the Noise Study.

EEA-81: I strongly encourage MassDOT to include study receptors in the Cambridgeport neighborhood, even if these locations do not meet procedures and protocol requirements for study.

Response: Since publication of the ENF, MassDOT expanded the noise Study Area to include noise sensitive locations in Cambridgeport, such as Magazine Beach, Morse Elementary School, and residences north of Memorial Drive (Granite Street, Florence Street, Tufts Street, Glenwood Avenue and the Riverside area north of River Street). The results of the noise impact assessment in Cambridgeport are presented in Section 5.11 and Appendix H, Noise and Vibration Analysis.

EEA-82: The DEIR should present the results of the noise and vibration modeling for the 2014 No Build Alternative, the Build and No Build 2020 Completion Year Alternatives, and the 2035 Design Year.

Response: MassDOT conducted noise and vibration analyses following the MassDOT/FHWA and FTA procedures and guidelines for evaluating noise for existing conditions, future Design Year (2040) Build conditions and future No Build (2040) conditions. The existing and future design years were adjusted from those described in the ENF due to the proposed Project schedule. The noise and vibration analyses also address differences in potential impact associated with Opening Year conditions, such as when the roadway improvements will be completed prior to completing West Station. The results of the noise and vibration impact assessment are presented in Section 5.11 and Appendix H, Noise and Vibration Analysis.

EEA-83: The DEIR should describe proposed abatement measures to mitigate anticipated noise or vibration impacts that may exceed the FTA, FHWA or other applicable criteria and demonstrate that these measures will reduce noise and vibration impact to acceptable levels per applicable standards. Consideration should be given to how decking or future air rights development may ameliorate projected noise and vibration impacts.

Response: See Response to EEA-7. MassDOT conducted a noise and vibration impact analysis and evaluated potential mitigation according to MassDOT policy and procedures. The results of the noise and vibration impact assessment and the evaluation of potential mitigation for each Project Alternative are presented in Section 5.11 and Appendix H, Noise and Vibration Analysis.

EEA-84: I encourage MassDOT to implement noise and operational best management practices (BMPs) equal to or more stringent than those currently utilized at other layover facilities along the commuter rail. To ensure compliance with modeling assumptions, I expect that MassDOT will provide documentation of these BMPs, and contractual obligations associated with the operator of the railroad in the DEIR. Specific consideration should be given to the hours of operation at the layover facility and West Station, potential idling times of locomotives, buses or shuttle services, and proximity to sensitive receptors.

Response: MassDOT will implement BMPs, such as installing electrical plug ins for the diesel-electric locomotives, and will adhere to state regulations to limit idling locomotives to 30 minutes to minimize potential noise impacts to nearby noise sensitive receptors. As described in Section 5.9, the layover facility is planned to be used for mid-day storage.

EEA-85: The DEIR should include a feasibility assessment of potential mitigation measures, a phasing plan for their implementation, and identification of responsible parties for their construction and maintenance.

Response: The Draft Section 61 Finding in Section 7.21 provides potential mitigation measures for the Preferred Alternative and each Throat Area Variation. Once a Throat is selected, a Final Section 61 Finding will be prepared for the Project and presented in the Final Environmental Impact Report (FEIR).

EEA-86: The DEIR should include an air quality analysis consisting of a regional emissions inventory for criteria pollutants (volatile organic compounds (VOCs), oxides of nitrogen (NOx), carbon monoxide (CO), sulfur oxides (SOx), and particulate matter (PM_{10}/$PM_{2.5}$). These emissions inventories should include daily and annual emissions from the diesel locomotives and motor vehicles on roadways in the air quality study area for the 2014 No Build Alternative, the Build and No Build 2020 Completion Year Alternatives, and the 2035 Design Year.

Response: Appendix F, Air Quality Analysis, includes a regional emissions inventory for VOCs, NOX, CO, SOx and PM_{10}/$PM_{2.5}$. It also includes emissions for both motor vehicles and diesel locomotives for 2015 Existing Conditions and 2040 No Build and Build Alternatives.

EEA-87: MassDOT should work with MassDEP prior to the preparation of the DEIR to establish the appropriate extent of the study area and modeling methodology.

Response: An air quality modeling protocol for the Project was submitted to MassDEP on May 7, 2015 and approved by MassDEP on May 12, 2015.

EEA-88: I encourage MassDOT to expand the pollutants analyzed to include air toxics, diesel PM and ultrafine particulates.

Response: Appendix F, Air Quality Analysis, includes qualitative analyses of mobile source air toxics, diesel particulates and ultrafine particulates.

EEA-89: Assumptions regarding locomotive technologies and MBTA bus fleet vehicles that can reasonably be expected to be in place in 2020 and 2035 and corresponding air quality benefits should be clearly stated in the DEIR. This discussion should also include the use of plug-in facilities at layover yards and the potential air quality benefits thereof and indicate whether locomotives will remain idling during layover, particularly during cold weather.

Response: Locomotive emissions calculations assume U.S. EPA Tier-4 Locomotive Exhaust Emission Standards are in place in 2040. The calculations are provided in Appendix F, Air Quality Analysis. The proposed mitigation measures include electric plug-in heaters, and the average reduction in pollutant emissions is estimated to be approximately 8%.

EEA-90: The DEIR should discuss possible mitigation measures to offset potential air quality impacts pending the results of the air quality analysis. Similar to the noise and vibration assessment, MassDOT should consider how projected air rights development and decking of the West Station and BPY sites may influence the concentration or dispersion of air pollutants.

Response: Potential impacts and mitigation measures regarding air quality are discussed in Section 5.10 and Section 7.10, respectively. As discussed in Appendix A, Rail Yard and West Station Alternatives Analysis, the proposed layout of the rail yard and station will not preclude the installation a ventilation system to vent diesel exhaust from the train engines. This will be constructed in the case of an overbuild scenario in the future.

Appendix F, Air Quality Analysis, includes proposed mitigation measures that will reduce air quality impacts associated with the Project. The air dispersion analyses include West Station and BPY layover area, but do not include future air rights development since these concepts are not part of the Project.

EEA-91: MassDOT should conduct a mesoscale analysis to estimate the total daily emissions of VOCs, NOx and CO in the project study area for the 2014 No Build Alternative, the Build and No Build 2020 Completion Year Alternatives, and the 2035 Design Year. The ENF indicated that MassDOT does not intend to analyze associated mitigation scenarios since the project does not specifically include any traffic-generating projects. However, the DEIR should consider traffic generated by the proposed West Station as this specific project is may create new traffic trips within the Study Area.

Response: Appendix F, Air Quality Analysis, and Appendix G, Greenhouse Gas Analysis, respectively, include mesoscale analyses for 2015 Existing Conditions and 2040 No Build and Build Alternatives. Both the air quality and GHG include mitigation that shows that West Station will potentially reduce motor vehicle traffic by approximately 7%.

EEA-92: The DEIR should also include a localized microscale assessment of CO hotspot, or intersection analysis, using the EPA's CAL3QHC model for BPY layover facility and at each traffic study intersection with a projected LOS equal to D, E, or F where the project adds ten percent or more traffic volume. The microscale analyses should evaluate conditions in the 2014 No Build Alternative, the Build and No Build 2020 Completion Year Alternatives, and the 2035 Design Year. Predicted CO concentrations should be compared to the State and National Ambient Air Quality Standards (NAAQS). If violations of the NAAQS are projected to occur, the DEIR should identify appropriate mitigation measures.

Response: Appendix F, Air Quality Analysis, includes a CO hotspot analysis using U.S. EPA's CAL3QHC model for 2015 Existing Conditions and 2040 No Build and Build Alternatives. U.S. EPA guidance was used to select the five intersections that could be potential hot spots that were included in the analysis. All predicted maximum CO concentrations are below their respective NAAQS.

EEA-93: MassDOT should determine if a PM quantitative hotspot analysis is needed and if data are available, conduct a quantitative PM hotspot analysis that focuses only on the emissions from the diesel trains and the motor vehicles in the air quality study area following current EPA guidelines. PM hot-spot analyses are required for projects of "local air quality concern" which include certain highway and transit projects that involve significant levels of diesel vehicle traffic and any other project identified in the PM State Implementation Plan as a localized air quality concern. If data are unavailable or if consensus with the MassDEP cannot be reached on the analysis area or the methodology, MassDOT should conduct a qualitative analysis following joint FHWA and U.S. EPA previous guidance dated March 2006. MassDOT should also conduct a screening analysis of nitrogen dioxide (NO_2) using dispersion modeling.

Response: Appendix F, Air Quality Analysis, includes a $PM_{2.5}$ hotspot analysis following U.S. EPA's November 2013 guidance. Appendix F also includes a NO2 air dispersion analysis. The $PM_{2.5}$ analysis included both vehicle traffic and locomotives.

EEA-94: The DEIR should discuss how the project will comply with applicable anti-idling regulations during the construction period and during layover facility and West Station operations.

Response: MassDOT will implement BMPs, such as installing electrical plug-ins for the diesel-electric locomotives, for the purpose of adhering to state regulations to limit idling locomotives to 30 minutes to minimize air quality impacts. Use of the plug-ins will also provide a noise benefit. See Section 5.11 for more information.

Section 5.10 includes locomotive idling in the BPY layover area be limited to 30 minutes in an hour per 310 CMR 7.11. Section 7.10.3 2 states that all construction equipment would be required to comply with 310 CMR 7.11 (1) (b), which requires that engines idle for no more than five minutes. This information will be included in the Project specifications for implementation by the contractor.

EEA-95: The DEIR should confirm the presence of State-regulated wetland resource areas, characterize these wetland resource areas and estimate potential temporary or permanent impacts associated with each project alternative. The DEIR should describe how each element will be designed and constructed in a manner consistent with relevant performance standards established in the WPA Regulations (310 CMR 10.00). If impacts will result in the direct alteration of wetland resources and require mitigation, the DEIR should include plans depicting and quantifying wetlands replication areas and describe how altered wetland functions will be restored.

Response: Section 4.12, Figure 4.12-1 and Graphics 4.12-1 and 4.12-2 illustrate and characterize the existing state-regulated resource areas within the Project Area. Section 5.12, Figures 5.12-1 through 5.12-3, and Graphics 5.12-1 and 5.12-2 illustrate the impacts to state-regulated resource areas. Section 5.12.4 discusses conformance with performance standards for each Throat Area Variation. Mitigation is discussed in Section 7.12. Discussion of final specific mitigation measures will be provided in the FEIR upon the selection of a preferred Throat Area Variation when final impacts will be determined.

EEA-96: The DEIR should include an assessment of how the project will be designed and implemented in a manner consistent with CZM policies.

Response: The Project is not located within the Coastal Zone and therefore consistency with CZM policies is not applicable. This was confirmed with MEPA after the ENF filing.

EEA-97: The DEIR should include graphics that overlay key c. 91 jurisdictional criteria (e.g., Historic Mean High and Mean Low Water Marks, Ordinary High Water Marks, filled tidelands, landlocked tidelands, etc.) on project area conceptual designs.

Response: Figures 5.12-4 through 5.12-7 provide overlays of Chapter 91 jurisdiction for the Preferred Alternative and each of the Throat Area Variation, with respect to HMHW and HMLW, OHW and Filled Tidelands. Landlocked Tidelands are shown on Figure 5.12-4.

EEA-98: The DEIR should include a table summarizing project impacts to filled tidelands and landlocked tidelands for each project element.

Response: Section 5.12 and Table 5.12-1 provides overall Chapter 91 impacts to Filled and Flowed Tideland for the Preferred Alternative and the Throat Area Variations including the conversion of non-water dependent roadway into water-dependent park. Figure 5.12-4 shows an overlay of the Preferred Alternative on existing landlocked tidelands.

EEA-99: The DEIR should identify areas on or adjacent to the project site that have existing c. 91 Licenses and identify site attributes approved in conjunction with those historic licenses. MassDEP has determined that the proposed project, as presented in the ENF, is a nonwater-dependent infrastructure project pursuant to 310 CMR 9.55; therefore, the requirements of 310 CMR 9.51 through 9.53 shall not apply. The DEIR should demonstrate how project alternatives will be designed to meet performance standards outlined in 310 CMR 9.55(1)(a-f) for the proposed uses. I strongly encourage MassDOT to meet with the MassDEP Waterways program prior to preparing the DEIR to ensure that sufficient information is provided in the DEIR to assist MassDEP in providing meaningful comments on the project's consistency with c. 91 licensing standards.

Response: Appendix I, Chapter 91 Historic Licenses and Legislative Authorizations, contains a plan and list of Chapter 91 Licenses and legislative authorizations on and adjacent to the Project Area. Section 5.12.7 provides details on how the Project complies with the standards found at 310 CMR 9.55.

EEA-100: The project site is subject to the provisions of An Act Relative to Licensing Requirements for Certain Tidelands (2007 Mass. Acts Ch. 168) (the Act). Section 3 of the Act requires that any project that is subject to MEPA review and proposes a new use or structure or modification of an existing use or structure within landlocked tidelands address the project's impacts on tidelands and identify measures to avoid, minimize or mitigate any adverse impacts on these rights.... The DEIR should include a discussion of how the project complies with the Public Benefit Determination (301 CMR 13.00) criteria established for nonwater-dependent projects located completely or partially within tidelands or landlocked tidelands.

Response: Chapter 8 provides a discussion of Project compliance with Public Benefit Determination criteria under 301 CMR 13.00.

EEA-101: The DEIR should discuss how each project element (including the BPY layover facility) will be designed in compliance with MassDEP Stormwater Management Regulations (SMR) and its associated Stormwater Policy, as applicable, and provide supporting drainage calculations. The DEIR should identify and describe the location of existing storm drain systems that will receive stormwater flows generated by the project.

Response: A description of the existing stormwater management system is included in Section 4.17 and shown on Figures 4.17-1 and 4.17-2. The proposed system is described in Section 5.17 and shown on Figures 5.17-1 through 5.17-4. All three Throat Area Variations will result in a reduction in impervious area, and therefore, the Project is considered a redevelopment. The Project will be designed to comply with the MassDEP Stormwater Management Standards as summarized in Section 5.17.2 and Appendix M, Stormwater Management Technical Appendix.

EEA-102: The DEIR should provide a history of drainage management on-site, including the conversion of Salt Creek from a wetland area to a culverted conveyance. The DEIR should describe existing connections of stormwater flows to Boston Water and Sewer Commission (BWSC) or MWRA sanitary or combined sewers. The DEIR should indicate if stormwater flows to sanitary or combined sewers will be removed in conjunction with the project and how flows from these removed connections will be redirected to the storm drain system and associated discharge points (Charles River or otherwise).

Response: Refer to Section 4.17 for the discussion of the history of Salt Creek and existing drainage infrastructure. Within the Project Area, existing sanitary sewer connections are limited to public transportation infrastructure support building facilities. All connections are to sanitary sewer mains based on as-built plans circa 1960. These existing connections have, in some instances, been plugged and abandoned. The remaining connections will be plugged and abandoned in the Project Area. Detailed engineering plans showing the locations of existing, proposed and connections to be removed will be developed during final design.

EEA-103: MassDOT should confirm with MassDEP that each element of the project will be reviewed under the "redevelopment" standards of the SMR.

Response: The Project qualifies as a redevelopment since all three Throat Area Variations will result in a net decrease in impervious cover and improve existing conditions. See Section 5.17.2.

EEA-104: The DEIR should include a conceptual discussion of proposed BMPs that may be selected in the final design phase. MassDOT should demonstrate in the DEIR that the project's conceptual designs include sufficient measures capable of conveying and treating estimated stormwater flows generated by the project, including a discussion of existing and proposed stormwater infrastructure, outfall locations, and connections to infrastructure susceptible to combined sewer overflows (CSOs). The stormwater analysis should evaluate and compare storm-event peak flow rates and volumes to existing conditions based upon conceptual designs for the project.

Response: The proposed stormwater management design and impacts are addressed in Section 5.17. The proposed redevelopment will transform the site from one that provides no stormwater quality enhancements to a modern stormwater management system that will greatly enhance stormwater quality compared to existing conditions. Conceptual BMPs associated with the Project are provided in Section 5.17. The proposed stormwater conveyance system is conceptually sized to meet stormwater flows. Refer to Appendix M, Stormwater Management Technical Appendix, for preliminary calculations for treatment volumes and peak flow attenuation. Proposed stormwater discharge pipe locations are shown on Figures 5.12-1 through 5.12-3. No combined sewer lines are located in the Project Area.

EEA-105: The DEIR should explain how water quality and quantity impacts will be controlled in compliance with associated performance standards and the City of Boston's Storm Water Program.

Response: Section 5.17 includes a description of the Project's water quality and quantity proposed stormwater management system. MassDOT has met with the BWSC regarding the proposed stormwater management system and incorporated their input into the proposed design. As previously stated, the Project proposes several BMPs within the Project Area that will greatly enhance the water quality and quantity of stormwater discharging from the site. An analysis of these improvements is included in Section 5.17 and Appendix M, Stormwater Management Technical Appendix.

EEA-106: As required by MassDEP, the DEIR should contain an analysis to substantiate that the claim that the stormwater standards at 310 CMR 10.05(6)(k) are met to the maximum extent practicable and improve existing conditions pursuant to 310 CMR 10.05(6)(k)(7) and 310 CMR 10.05(6)(o)(2). Also in accordance with the wetland regulations in 310 CMR 10.05(6)(o)(2), a complete evaluate of appropriate stormwater management measures for the project site is required, including environmentally sensitive design and low impact development (LID) techniques, structural BMPs, pollution prevention, and other applicable stormwater control measures. I also note that compliance with Boston's Complete Streets Initiative, MassDOT must incorporate green infrastructure into street design (e.g., landscape plantings, rain gardens and vegetative swales, infiltration basins, and paving materials and permeable surfaces). Opportunities for stormwater management within a proposed multi-use path that extends from west to east across the site, with potential connections to other planned facilities, should be explored. If this evaluation demonstrates that full compliance cannot be achieved, then the DEIR must demonstrate that the highest practical level of stormwater management is proposed.

Response: Refer to Section 5.17.1 for a menu of potential BMPs for water quality treatment. Appendix M, Stormwater Management Technical Appendix, provides a description of how the Project is using a series of Low Impact Development Techniques, in combination with structural BMPs and pollution prevention practices, to achieve an increase in stormwater quality compared to existing conditions. Cambridge Street and Cambridge Street South will include street tree plantings and enhanced tree trenches that promote water quality treatment and infiltration. See Appendix M, Stormwater Management Technical Appendix, for a discussion of compliance with MassDEP Stormwater Management Standards.

EEA-107: As noted previously, the Charles River segment adjacent to the project is listed as an impaired water body according to the Massachusetts Year 2014 Integrated List of Waters. Several TMDLs have been established to address impairments due to phosphorus (total), nutrient/eutrophication biological indicators, Secchi disk transparency, and E. coli. The DEIR should evaluate the project's proposed stormwater management system for consistency with these TMDLs, note the types of BMPs designed to address specific pollutants, and consider opportunities to minimize runoff impacts to the Charles River.

Response: MassDOT has advanced the development of the stormwater BMPs for the Project in an effort to provide the maximum reduction in phosphorous and nutrient loading practicable. The goal is to infiltrate as much stormwater as possible to reduce pollutant loadings to the river. For this Project, the feasibility and applicability of infiltration BMPs will be highly dependent upon site conditions with respect to contamination due to previous uses, depth to seasonal high groundwater, sufficient space, suitability of soils and limiting layers of clay/bedrock, all of which will directly influence and/or restrict the use of infiltration BMPs. Refer to Section 5.17.2 and Appendix M, Stormwater Management Technical Appendix, for preliminary calculations and discussion of compliance with the phosphorous and pathogen TMDLs. The Project includes low impact design strategies and porous pavement where practicable.

EEA-108: The BWSC requires project in the lower Charles River watershed to infiltrate all stormwater discharging from impervious surfaces to meet the phosphorous TMDL. The DEIR should demonstrate that sufficient area exists on-site to accommodate necessary recharge areas and confirm that soil and depth to groundwater conditions are conducive to meeting these recharge requirements.

Response: Refer to Section 5.17.2 for a discussion of the feasibility of infiltrating on-site. For this Project, the feasibility and applicability of infiltration BMPs will be highly dependent upon site conditions with respect to contamination due to previous uses, depth to groundwater, sufficient space, suitability of soils and limiting layers of clay/bedrock, all of which will influence and/or restrict the use of some BMPs such as infiltration. Calculations and methodology are provided in Appendix M, Stormwater Management Technical Appendix.

EEA-109: The DEIR should discuss BMPs to be implemented within the layover facilities to manage and treat locomotive/rail car or car washing stormwater discharges.

Response: Locomotive drip pans connected to oil-water separators will be located at each trainset engine location. Maintenance facilities, including the car washing facility, are no longer proposed as part of the Project.

EEA-110: The DEIR should provide an estimate of wastewater generation and water usage, tabulated by use (West Station, BPY layover) and location. The DEIR should clearly state assumptions used to generate these estimates.

Response: An estimate of wastewater generation is provided in Table 5.18.3 and water usage is provided in Table 5.18-1 and 5.18-2 for 2025 and 2040 for West Station and the BPY layover along with assumptions used to generate these estimates.

EEA-111: The DEIR should include a description and supporting graphic characterizing the existing water and wastewater system associated with the project site from the point of origin to the point of treatment and/or discharge (e.g., ownership, state of repair, diameter, etc.). The DEIR should clarify what infrastructure is solely for sanitary purposes and what infrastructure conveys combined flows (sanitary and stormwater). As noted by comments from the MWRA and the BWSC, several existing pipes currently traverse the project site. The MWRA letter noted the likely requirement for MassDOT to obtain an 8(m) permit in accordance with Section 8(m) of Chapter 372 of the Acts of 1984 to protect existing water infrastructure (Sections 9, 2 and 3, WASM4 and Shaft 8 of the City Tunnel Extension). The DEIR should confirm the availability of sufficient water and sewer conveyance capacity for each of the project alternatives and identify if new water or sewer mains will be necessary to construct the project's various components.

Response: Section 4.18 and Figure 4.18-1 characterize the existing water and wastewater systems within the Project Area. The flow type (sanitary, stormwater, combined) is also described. MWRA 8m permits will be required for elements of the Project that will impact MWRA facilities. Section 5.18 discusses the availability of sufficient water and sewer conveyance capacity for rail operations and identifies new water and sewer mains necessary to construct the various Project components. Combined flow infrastructure does not exist in the Project. BWSC monitors flow from their stormwater outfalls on the Charles River, which is in the Project Area, as part of the U.S. EPA Consent Decree, to identify and remove illicit discharges upstream of the Project. Figures 5.18-1 through 5.18-3 show the major water and sewer utilities overlain on the Preferred Alternative and Throat Variations.

EEA-112: The DEIR should identify easements associated with existing infrastructure and note if relocation of these utilities will be necessary in conjunction with the conceptual project plans.

Response: Easements associated with existing infrastructure and utilities are shown on Figure 4.2-1. Utilities relative to the Throat Area Variations are shown on Figures 5.18-1 through 5.18-3. Note that none of the existing utilities will require relocation in conjunction with the Preferred Alternative Urban Interchange and Throat Area Variations 3K-HV and 3K-ABC. However, as discussed in Section 5.18, the 3K-AMP Variation will require relocation of an MWRA water line.

EEA-113: MassDOT should coordinate with the MWRA and the BSWC to ensure that conceptual and final design plans are consistent with applicable requirements and maximize potential benefits to the wastewater system at large.

Response: MassDOT is committed to continuing coordination with MWRA and BWSC through final design to meet applicable design, operation and maintenance requirements of each agency.

EEA-114: The DEIR should clarify if the project includes the construction of new water mains and wastewater infrastructure within Cambridge Street and the proposed urban street grid (i.e., North Connector, East Drive Connector, Stadium Way Connector, Seattle Street Connector, and West Connector). If so, MassDOT should use future land use assumptions to appropriately size proposed infrastructure.

Response: The proposed highway and street grid infrastructure will include water, sewer, power, and gas that will be sized and funded by the land owner to accommodate future development; the infrastructure will be installed by MassDOT.

EEA-115: The DEIR should clarify if the BPY layover facilities will utilize water for rail car or equipment washing or for repair and maintenance activities, and whether the associated wastewater is considered "industrial wastewater" requiring permitting by MassDEP. The DEIR should elaborate on the proposed use of recycle water for the proposed car washing facilities, including the potential potable water savings afforded by implementation of this technology.

Response: Maintenance facilities in the rail yard, including the car washing facility, are no longer proposed as part of the Project. Only light maintenance not requiring heavy equipment or facilities would occur at the rail yard, consisting of activities such as trash removal, internal car cleaning and refueling. See Appendix A, Rail Yard and West Station Alternatives Analysis, for further discussion.

EEA-116: In addition, the DEIR should indicate whether the project will be required to offset new flows by assisting in the removal of inflow and infiltration (I/I) from a hydraulically related portion of the sewer system.

Response: Available CCTV inspection videos and data from MWRA were reviewed. A supplemental CCTV program was conducted on sewer and drainage systems, which will be maintained in service and adapted to meet the needs of the Project. The CCTV program included pipeline and manhole inspection in accordance with National Association of Sewer Service Companies (NASSCO) condition grading systems. This investigation identified defects in the infrastructure and potential sources of infiltration and inflow. The investigation cataloged lateral connections in order to identify cross-connections between the sewer and drainage systems. The results were used to design repairs to existing components and replacement of failed components. The Project does not include combined sewer systems.

EEA-117: Finally, MassDOT's plans for exterior spaces around West Station and roadways should include provisions for a variety of drought-tolerant, native species to limit or eliminate project demand for irrigation.

Response: Landscaping design specifications associated with West Station will be developed in accordance with MassDOT's *Project Development and Design Guide*, Chapter 13, Landscape and Aesthetics.

EEA-118: The DEIR should include a GHG analysis prepared in compliance with the MEPA GHG Policy and Protocol ("the Policy"). The Policy requires projects to quantify carbon dioxide (CO_2) emissions and identify measures to avoid, minimize or mitigate such emissions. The analysis quantifies the direct and indirect CO_2 emissions associated with the project's energy use (stationary sources) and transportation-related emissions (mobile sources). The GHG analysis should evaluate CO_2 emissions for two scenarios as required by the Policy including 1) a Base Case and 2) a Build with Improvements Condition. In the case of the structures associated with the BPY layover facility and West Station, the Build with Improvements alternative should include energy efficiency design measures in order to meet the Stretch Energy Code (Stretch Code), while the Base Case should be consistent with the applicable State Building Code in effect at the time the ENF was filed. MassDOT should meet with staff from the MEPA office, the Department of Energy Resources (DOER) and MassDEP prior to performing the GHG analysis to confirm modeling assumptions and methodology.

Response: The Greenhouse Gas Analysis in Appendix G follows the MEPA GHG Policy and Protocol dated May 5, 2010. It presents both a Base Case and a Build with CO_2 Mitigation Alternative. The Mitigation Alternative will reduce stationary sources emissions by 36.5%, compared to the Base Case. The Mitigation Alternative will exceed the requirements of the Stretch Code, which references the IECC 2015 code including Section C406.3 that requires lower light power density lighting.

EEA-119: The City of Boston has adopted the Stretch Code subsequent to its designation as a Green Community under the provisions of the Green Communities Act of 2008. Therefore, the project will be required to meet the applicable version of the Stretch Code in effect at the time of construction. The Stretch Code increases the energy efficiency code requirements for new construction (both residential and commercial) and for major residential renovations or additions in municipalities that adopt it. Projects may meet the Stretch Code requirement of 20-percent better energy efficiency than the State's base energy code by either meeting the standard of 20- percent better than the base code, or by using a prescriptive energy code. The DEIR should demonstrate that the project can be designed to meet the Stretch Code requirements.

Response: The Greenhouse Gas Analysis in Appendix G presents the results of the analyses and demonstrates that the Mitigation Alternative for GHG emission reductions exceeds the requirements of the Stretch Energy Code.

EEA-120: As applicable, project elements may also be required to be Leadership in Energy and Environmental Design (LEED) certifiable in accordance with Article 37 of the Boston Zoning Code.

Response: West Station will be an open-air station, similar in concept to Yawkey Station, without any building structures. Therefore, LEED certification will not be applicable.

EEA-121: The DEIR should clearly state the types of modeling software used and emissions factors applied to GHG calculations.

Response: The GHG analysis was performed consistent with the EOEEA policy. Modeling software was not applicable because West Station will be an open-air station.

EEA-122: The GHG analysis should clearly demonstrated consistency with the objectives of MEPA review, one of which is to document the means by which MassDOT plans to avoid, minimize, or mitigate Damage to the Environmental to the maximum extent feasible. The DEIR should state modeling assumptions and explicitly note which GHG reduction measures have been modeled and those that cannot be modeled due to the constraints of the modeling software. The DEIR should include the modeling printout for each alternative and emission tables that compare Base Case emissions in tons with the Build with Improvements Condition showing the anticipated reduction in tons and percentage by emissions source (direct, indirect and transportation). The DEIR should include a clear and complete listing of modeling inputs (e.g., R-values, U-values, efficiencies, lighting power density, etc.) for items such as equipment, walls, ceilings, windows, lighting, HVAC units, etc. for both the Base Case and Build with Improvements Condition.

Response: Section 7.10 presents proposed mitigation measures to reduce GHG impacts associated with the Project. Appendix G, Greenhouse Gas Analysis, includes further details of the analysis including specifics of the modeling inputs and a summary table of CO_2 emissions for the base case and mitigation alternative.

EEA-123: The DEIR should describe additional GHG reduction measures expected to provide further benefits, but are not currently quantifiable (e.g., building orientation, building commissioning, use of an energy management system, Energy Star equipment, and water conservation and wastewater reduction measures, etc.).

Response: Section 7.10 presents proposed mitigation measures to reduce GHG impacts associated with the Project. The measures presented in the comment are not applicable to West Station since it will be an open-air station. The proposed station will include LED lighting for the station lighting systems (a lower light power density); high-efficiency elevators, and constructing the bus depot canopy as solar ready.

EEA-124: West Station and the BPY layover facility will be designed and constructed consistent with MBTA sustainability and energy management goals. The DEIR should summarize these goals put forth by the MBTA and specifically identify those measures that will be implemented and/or establish design and performance goals. The DEIR should identify potential energy efficiency measures to be incorporated into station design, drawing from lessons learned and successes of other recent projects such as Yawkey Station. I encourage MassDOT to consider opportunities to design and construct structures with an energy efficient core and shell (i.e., windows, wall and roof insulation, etc.), lighting systems, and heating and cooling systems (if provided). Section 7.9 provides additional information.

Response: West Station and BPY were designed in a manner consistent with MBTA sustainability and energy management goals. MBTA provides a range of construction standards and specifications, including those for rail yard maintenance facilities, rail bridges and general transportation facilities. Opportunities for energy reduction and renewable energy use were investigated during the design process. The following were considered during the preliminary design process and will continue to be investigated for use in the Project design during the Design-Build Process: evaluation criteria to include energy efficiency consideration; minimum LEED Silver level energy performance for BPY facilities; installation of sub-meters to enable detailed energy consumption accounting; LED lighting, where feasible; energy-efficient heating systems; enhanced lighting controls and sensors, where feasible; energy efficient building envelop; and consideration of solar energy generation concepts in West Station design phase. Procurement processes for the new West Station and BPY Project elements will require proposals to include energy-efficient measures where appropriate and include consideration of energy-efficiency measures in the evaluation criteria. Section 7.10 presents proposed mitigation measures to reduce GHG impacts associated with the Project.

EEA-125: MassDOT should evaluate the use of renewable energy sources to offset all or a portion of the project's energy demand (i.e., solar or photovoltaic (PV) panels, geothermal power, or the purchase of green power). The DEIR should include a separate analysis to determine if PV systems (either ground-mounted or building-mounted) to off-set electric demand or for hot water heating purposes (if such demand exists) are feasible in association with West Station or BPY layover. This feasibility analysis should use online DOER and Massachusetts Clean Energy Center (CEC) resources, or MBTA data from its own installations, to calculate potential project cost, payback periods and returns on investment. MassDOT should consider both first-party and third-party ownership/lease scenarios. The DEIR should state assumptions with regard to available area for PV equipment, efficiencies, etc. If feasible, I encourage MassDOT to commit to the use of PV systems at their facilities. At a minimum, buildings should be "solar ready" to facilitate future installation of PV systems. If PV is not financially feasible, I request that the MassDOT commit to revisit the PV financial analysis on a regular timetable and to implement PV when the financial outcomes meet specified objectives.

Response: The Greenhouse Gas Analysis in Appendix G includes a photovoltaic (PV) system feasibility analysis. As a result, the bus port canopy of West Station will be designed as solar ready for a possible third-party PV system.

EEA-126: As part of the GHG analysis, the DEIR should specifically address how the project advances MassDOT's targeted 7.6 percent decrease in transportation sector GHG emissions by 2020 as stated in the Massachusetts Clean Energy and Climate Plan for 2020. As recommended by MassDEP, MassDOT should consider expanding this analysis to assess consistency with MassDEP's additional goal of 12.3 percent GHG reductions by 2050. Reductions in mobile source emissions are a critical component of this goal. While the project, through the improvement of the I-90 interchange, will likely result in GHG emissions reductions in and of itself, the analysis should serve to evaluate if the project is maximizing the potential reductions to the extent feasible.

Response: Section 5.10 and Table 5.10-10 present the net reduction of the Project's total CO_2 emissions at 19.8% compared to the Base Case, which advances MassDOT's targeted reductions in transportation GHG emissions.

EEA-127: The DEIR should include an assessment of GHG emissions generated by mobile sources using data gathered as part of the mesoscale analysis. The DEIR should clearly state modeling assumptions, and provide separate analyses regarding study area vehicle emissions and those associated with rail operations at the BPY layover facility, West Station, or freight service.

Response: The mesoscale analysis includes a Project-related emissions inventory for CO_2. Separate calculations of CO_2 emissions from the BPY layover facility, West Station, and passenger and freight rail service were performed. This information is presented in Appendix F, Air Quality Analysis.

EEA-128: The DEIR should clarify how GHG emissions from buses or shuttle service to West Station are calculated, either as part of the broader vehicle emissions analysis, or as a discrete source.

Response: CO_2 emission factors used in the mesoscale analysis were calculated using MOVES input files provided by MassDEP, which account for buses and shuttles.

EEA-129: MassDOT should ensure that rail operations and equipment assumptions applied to the BPY layover facility and West Station are consistent with those presented in the SSX DEIR (or as modified in a subsequent MEPA filing). The analysis should include estimates of indirect emissions associated with the use of shore-side power at the BPY layover facility.

Response: The air quality analyses and emissions calculations for BPY layover facility and West Station are consistent with those presented in the SSX DEIR.

EEA-130: For vehicular traffic, the DEIR should use traffic volume, delay and speed data along with emissions factors (as described in the Policy) for a No Build existing condition, a future (2020 and 2035) Build condition and a Future (2020 and 2035) Build with Mitigation condition. These data should be used to inform the selection of a Preferred Alternative for the interchange and Cambridge Street. The DEIR should describe mitigation measures implemented as part of the future Build with Mitigation condition modeling. These measures may include, but should not be limited to, improvements to roadway operations, physical roadway infrastructure upgrades, mode share shift, railroad operations and equipment improvements, and use of CO_2 reduction technologies.

Response: CO_2 emission factors used in the mesoscale analysis were calculated using MOVES input files provided by MassDEP. The mesoscale emissions inventory for CO_2 emissions included a 2040 Build with Mitigation Alternative. The Mitigation Alternative included an approximate 7% reduction due to a reduction in motor vehicles associated with the addition of West Station. Section 5.9 describes the shift from motor vehicle to transit for both Allston and Brighton neighborhood due to West Station.

EEA-131: The DEIR should provide an analysis and discussion of potential impacts to the project site associated with predicted sea level rise, increased frequency and intensity of precipitation events and extreme heat events. To assist in the evaluation of climate change resiliency and adaptation measures the Proponent should review EOEEA's Climate Change Adaptation Report (September 2011) (http://www.mass.gov/eea/docs/eea/energy/cca/eea-climate-adaptation-report.pdf) and the Office of Coastal Zone Management's (CZM) December 2013 report entitled, "Sea Level Rise: Understanding and Applying Trends and Future Scenarios for Analysis and Planning" (http://www.mass.gov/eea/docs/czm/stormsmart/slr-guidance-2013.pdf).

The Proponent may also want to review the Boston Harbor Association's (THBA) "Preparing for the Rising Tide" report issued in 2013 for additional information. This analysis should consider floodplain areas as may be reflected in the FIRM maps issued for the project area. If a FIRM map is pending during the design/analysis phase, I strongly encourage MassDOT to use the pending maps, as recent amendments have tended to result in increased areas potentially subject to inundation during storm events. Finally, MassDOT should review currently available analyses and modeling data gathered by MassDOT and/or the City of Cambridge for the Charles River Dam under future sea level rise scenarios and modeled storm events (e.g., hurricanes). The future ability of the Charles River Dam to control the surface level of the Charles River Basin may be compromised due to climate change intensified events, potentially leading to flooding or stormwater management impacts within the project site.

Response: The Project design takes future weather conditions, such as sea level rise and severe weather events, into account to help protect the integrity and functionality of the highway, rail yard and West Station. MassDOT will size the proposed drainage systems for the Project using the storm event rainfall totals and distributions from the National Oceanic and Atmospheric Administration (NOAA) Precipitation-Frequency Atlas of the United States, Atlas 14 Volume 10. The rainfall distributions for the New England and New York regions were released in 2015 and encompass some of the more recent rainfall data, which helps combat potential future effects of climate change. In addition to designing the stormwater systems using conservative rainfall records and distributions, stormwater treatment features will be designed with controlled overflows as to not exasperate damage to the Project Area and/or adjacent properties. The proposed station platforms and bus loop are not anticipated to be vulnerable to severe weather events or sea level rise. The station would provide minor beneficial effects by providing limited screening for station users from wind and rainfall during severe storms, and shading during periods of extreme heat. Chapter 4.19 discusses the selected modeling for analyzing climate change. Chapter 5.19 provides the inundation vulnerability assessment for Project Alternatives. Chapter 7.19 provides a discussion of potential protective resiliency mitigation measures associated with climate change.

EEA-132: Using the CZM report and available modeling data for the Charles River Dam identified above, and with consideration for the level of acceptable risk to MassDOT and the projected project lifetime, MassDOT should select a predicted sea level rise and storm intensity scenario and evaluate in the DEIR how the project may be directly or indirectly impacted. The DEIR should discuss why a specific scenario (or scenarios) was selected for evaluation, describe associated sea level rise and storm surge elevations, identify the extent of inundation areas on-site and indicate how the project will be designed to mitigate this impact or to facilitate adaptation responses, if applicable. The project site or tributary wetlands may be subject to both inland and coastal flooding during severe weather events, and the evaluation should specifically consider the impacts of each type of flooding and the likelihood that they may occur concurrently. I encourage the Proponent to consult with the MEPA Office for additional clarification prior to undertaking this task.

Response: Chapter 4.19 discusses the selected modeling for analyzing climate change. Chapter 5.19 provides the inundation vulnerability assessment for Preferred Interchange and Throat Area Variations. Chapter 7.19 provides a discussion of potential protective resiliency mitigation measures associated with climate change. The vulnerability assessment in Chapter 5.19 specifically considers two levels of acceptable risk to MassDOT: the 1% probability event and the 0.1% probability event. Both risk tolerance thresholds are applied by MassDOT to various infrastructure in their climate adaptation planning; the selection of the appropriate level depends on the criticality of the infrastructure.

EEA-133: If modeling scenarios indicate potential climate change-induced flooding impacts, the DEIR should demonstrate that the project includes ecosystem-based adaptation measures and proactive infrastructure design with regard to impacts related to predicted sea level rise, storm intensity and extreme heat. Modifications to SFR, I-90 viaduct and interchange, roadway grid, adjacent parklands, and stormwater management infrastructure (including outfalls to the Charles River) should be implemented in a manner to promote climate change resiliency and adaptation. Design of West Station and the BPY layover facility should consider the ability to mitigate extreme heat impacts on rail infrastructure, treatment and conveyance of more frequent and intense rainfall events, and, if modeling indicates, mitigate flooding impacts from the Charles River.

Response: The conceptual drainage systems for the Project were designed using the storm event rainfall totals and distributions from the *NOAA Precipitation-Frequency Atlas of the United States, Atlas 14 Volume 10.* The rainfall distributions for the New England and New York regions were released in 2015 and encompass some of the more recent rainfall data, which helps combat potential future effects of climate change. In addition to designing the stormwater systems using conservative rainfall records and distributions, the proposed stormwater treatment features will be designed with controlled overflows as to not exasperate damage to the site and/or adjacent properties. Chapter 7.19 provides a discussion of potential protective resiliency mitigation measures associated with climate change. Where possible, these resiliency mitigation measures are ecosystem-based, especially in the open space along the Charles River, which could be designed to protect inland project areas from coastal flooding during severe weather events.

The proposed West Station platforms and bus loop will not be vulnerable to severe weather events or sea level rise. The station will provide minor beneficial effects by providing limited screening for station users from wind and rainfall during severe storms, and shading during periods of extreme heat.

EEA-134: The DEIR should include a complete list of historic properties and detailed project maps or plans depicting the locations of historic properties or historic district boundaries compared to project features. The DEIR should identify the Area of Potential Effect (APE) for the project for both historic and archaeological resources and identify and evaluate historic and archaeological resources therein. If necessary, reconnaissance surveys for historic or archaeological resources within each designated APE should be prepared in consultation with MHC.

Response: A discussion of historic properties within the Project's APE is provided in Section 4.6. Inventory forms are provided in Appendix E for those properties that will be impacted. Figure 4-6.1 shows the APE. Figures 5.6-1 through 5.6-6 provide the historic boundaries and properties with respect to the Preferred Interchange Alternative and each Throat Area Variation.

EEA-135: The DEIR should address conflicting information provided by MHC and DCR regarding the contributory status of SFR to the Charles River Parkway District (BOS.YK).

Response: Section 4.6.1 discusses the contributory status of SFR to the Charles River Basin Historic District (BOS.CA) and the Charles River Parkway District (BOS.YK). It is MassDOT's opinion that the portion of SFR within the Project Area was intended to be a contributing element within the Charles River Basin Historic District (BOS.CA). The nomination form for the district states that "the Charles River Basin National Register District incorporates the Charles River Basin and the parkways and landscaped areas on both banks for approximately six miles upstream from the Charles River Dam to the Eliot Bridge…it includes…the James J. Storrow Memorial Drive and Soldiers' Field Road in Boston…" The portion of SFR within the bounds of the Project Area is, however, outside the bounds of the Charles River Parkways District (BOS.YK), the eastern boundary of which (at the Elliot Bridge) is outside the Project's APE.

EEA-136: The DEIR should discuss the potential impacts and benefits to historic resources associated with the proposed realignment of SFR and pedestrian and bicycle bridge to the Paul Dudley White Bike Path.

Response: Section 5.6.2.1 discusses the potential impact and benefits to historic resources associated with the realignment of SFR. The Preferred Alternative now includes constructing a new underpass and shifting the alignment of SFR which will have the dual benefit of providing a new at-grade connection for pedestrians and bicyclists to the Charles River while also creating additional parkland next to the river.

EEA-137: The DEIR should include the results of any consultations conducted with the MHC in accordance with Section 106 of the National Historic Preservation Act of 1966 (36 CFR Part 800) and State Register Review (950 CMR 71.00). Impacts associated with the project may be unavoidable. MassDOT should work with MHC and interested parties to develop appropriate mitigation measures to minimize or mitigate impacts to historic resources. The DEIR should include possible mitigation measures to be considered as part of the State Register and Section 106 Review processes. This may include the preparation of a Memorandum of Agreement (MOA) between affected parties.

Response: The "State and Federal Historic Preservation Laws" section of the table in Section 6.1 discusses the consultation process. No consultation between FHWA, MassDOT and the State Historic Preservation Officer/MHC has taken place to date. Review of all Project components is required, and FHWA, as the lead federal agency for the Project, will be responsible for initiating consultation with the State Historic Preservation Officer (SHPO), in accordance with Section 106 of the National Historic Preservation Act of 1966 (36 CFR 800). The initiation of the Section 106 review process typically begins after a Preferred Alternative is selected and project funding has been obtained. After consultation with the SHPO and MassDOT, FHWA will determine Project impacts on historic properties. In the event the Project is found to have an adverse effect on historic properties that cannot be avoided or minimized, mitigation measures will be developed. Under the state historic preservation law (950 CMR 71.00), "completed project review under the National Historic Preservation Act of 1966 shall ordinarily fulfill the requirements of compliance with M.G.L. c.9, §§ 26 through 27C, unless otherwise determined by the MHC [Massachusetts Historical Commission]."

EEA-138: The DEIR should characterize, describe the location, review status, and responsible party for the two identified open MCP RTNs within the project area. Furthermore, the DEIR should describe how MCP-regulated conditions associated with these two RTNs, as well as the resolved RTNs identified in the ENF, may impact construction techniques (i.e., dewatering, foundation types, etc.) or potential site infrastructure (e.g., groundwater and stormwater management, new or relocated water, sewer and drainage pipes). As noted by MassDEP, the reporting concentrations of contaminants have [sic] changed, meaning that further investigation and characterization of the soils on sites with closed Response Action Outcomes (RAO) may be necessary. Of notable concern is the potential implication of historic soil and groundwater contamination on stormwater infiltration requirements for the project in accordance with the MassDEP Stormwater Standards.

Response: A complete summary and locations of all MCP RTNs is provided in Appendix J, Hazardous Materials Assessment Report. This report includes a discussion of both active sites and those that have achieved regulatory closure within the Project Area, as well as those sites that are nearby that may impact the Project Area. Management of known or potentially OHM-impacted excavated materials is discussed in Section 7.20; the results of all laboratory testing will be compared to applicable current MCP thresholds. Potential remobilization of OHM due to infiltration will be evaluated as part of testing to evaluate soil ability to assimilate altered hydraulic load during potential infiltration.

EEA-139: The DEIR should identify any State permits related to solid and hazardous waste mitigation.

Response: State permits related to soil and hazardous waste are included in Chapter 6.

EEA-140: The DEIR should clarify the responsible parties for remedying known oil and hazardous materials (OHM) spills within the project area (i.e., the two open RTNs), identify remediation schedules in relation to the proposed MassDOT construction periods, and describe anticipated coordination efforts between MassDOT and these responsible parties to ensure project advancement in compliance with the MCP.

Response: Active MCP sites are referenced in Section 4.20. Details regarding all sites are presented in Appendix J, Hazardous Materials Assessment Report, including the responsible parties and the compliance schedules of active sites. As noted in Section 7.20, management of excavated materials relative to these disposal sites will be coordinated with the PRPs, and construction activities will be coordinated with ongoing response actions conducted by the PRPs for those sites to the extent practicable.

EEA-141: Beyond these identified RTNs, the project will likely require additional reviews relative to the MCP given the historic uses within the project area. If MassDOT conducts a Phase I Environmental Site Assessment (ESA), or if others have completed ESAs that identify any recognized environmental conditions associated the project area, MassDOT should summarize the results of these ESAs in the DEIR. Based upon the results of these ESAs, the DEIR should identify any MCP-regulated environmental conditions and list recommendations for further evaluation or testing.

Response: A Project Area-wide Hazardous Materials Assessment Report (Appendix J) was prepared and includes a review of local records, available on-line databases, historical aerial photographs, historical fire insurance maps and site history review. In addition to the known MCP disposal sites, it tabulates other potential sites of environmental concern in Table 3 List of Suspected Sites of Environmental Concern in Appendix J. Section 7.20 notes that conditions identified in the Hazardous Materials Assessment Report will inform required Soil Management Plans (SMPs) to be developed as part of construction phase planning.

EEA-142: The DEIR should include a conceptual construction phasing plan for each project element, noting times of concurrent activity (e.g., viaduct removal and BPY layover construction) and the estimated length of each construction phase. The DEIR should provide additional justification for the phasing assumption presented in the ENF and identify the duration of the peak and off-peak periods that will dictate lane closures and the need to establish detours during off-peak periods on SFR.

Response: A detailed construction phasing approach is provided in Section 5.22. Section 7.8 includes construction term traffic management mitigation measures.

EEA-143: Given the critical nature of the Masspike and the I-90 interchange within the local and regional traffic system, the DEIR should address the potential operational impacts of extended lane closures and identify measures to mitigate their impact.

Response: Maintenance of traffic during construction is discussed in Section 7.8.2.

EEA-144: I note the construction staging recommendations provided in the comment letter from A Better City (ABC) and request that MassDOT evaluate the feasibility of these recommendations as part of the DEIR.

Response: MassDOT is presenting the most feasible approach to constructing the 3K-HV Variation. 3K-HV will construct the temporary viaduct widening to maintain travel lanes during construction of the viaduct and will be removed as part of the final condition to limit impacts to Section 4(f) parkland.

EEA-145: The construction phasing plan must consider available laydown and equipment storage areas and how they will be managed so as not to impede rail service connections through the project site, including commuter rail service, access to BPY layover facilities, and freight movement. If passenger rail and freight service will be modified during project construction (based on construction phases) the DEIR should identify how service impacts will be accommodated and minimized or mitigated.

Response: Construction staging is discussed in Section 5.21. Project phasing is discussed in Section 5.22. Figures 5.21-1 through 5.22-9 provide staging graphics with the conceptual location and management of laydown and equipment storage areas.

EEA-146: MassDOT should develop staging and construction period access plans in collaboration with the City of Boston, City of Cambridge, Harvard University, Amtrak, the MBTA and other landowners as required.

Response: MassDOT will coordinate with potentially impacted stakeholders to develop acceptable specifications for construction to minimize access restraints and property impacts. A detailed construction phasing approach is provided in Section 5.22.

EEA-147: I strongly encourage MassDOT to consider innovative construction techniques, including the pre-construction of viaduct components either on or off-site or use of temporary structures, to reduce construction period lengths and lane closures.

Response: MassDOT will evaluate innovative and rapid construction techniques during final design.

EEA-148: The project must comply with MassDEP's Solid Waste and Air Pollution Control regulations, pursuant to M.G.L. c.40, §54. MassDOT should consult the MassDEP comment letter with regard to regulatory requirements and potential mitigation measures to be implemented during the construction period.

Response: See responses to DEP-23 through DEP-33.

EEA-149: The DEIR should include a discussion of MassDOT's recycling goals for solid waste generated as part of the project's construction and how demolition activities will comply with the goals of the Massachusetts Solid Waste Master Plan. This information may be included as part of a larger draft Construction Waste Management Plan for the project.

Response: MassDOT is committed to environmental stewardship and supports the recycling of roadway and construction materials. The agency encourages the use of recycled bituminous pavement and allows these materials to be blended with borrow material to service as a substitute for ordinary borrow and gravel borrow, for installation under new pavement and sidewalk areas.

EEA-150: The DEIR should also describe potential project site construction period impacts (including but not limited to traffic management, materials management, parking, air quality and noise impacts, and other items as they related to the construction period) and analyze and outline feasible measures that can be implemented to eliminate or minimize these impacts.

Response: Section 7.8.2 discusses construction maintenance of traffic and pedestrian access. Section 7.17 includes stormwater BMPs for construction-term implementation. Section 7.20 discusses materials management. Section 7.10 discusses potential air quality impacts and associated mitigation measures, and Section 7.11. describes construction-term noise impacts and mitigation. In terms of construction worker parking, the specifics/requirements for this aspect of the Project will be developed as the design is advanced, and the resulting requirements incorporated into the Design-Build (DB) contractors' RFP package. The selected DB entity will be required to encourage their workers to use public transportation to travel to the job site, and that the DB entity will also be required to provide sufficient parking on-site for those workers who arrive by vehicle. Therefore, there will not be an impact to the on-street parking supply in the adjacent North Allston neighborhoods during construction.

EEA-151: The DEIR should include a draft Construction Management Plan (CMP) to demonstrate how construction period impacts will be mitigated. Specifically, the DEIR should identify truck traffic routes associated with construction traffic, staging areas, and how safe pedestrian, bicycle and vehicle access will be maintained throughout the construction period for each proposed project phase.

Response: The Project is intended to be constructed under a DB procurement process. As such, details for temporary routes and similar accommodations requested in a CMP will be provided at a later date when the design-build contract is awarded. Detailed construction phasing plans, including staging areas, are shown in Figures 5.21-1 through 5.22-9. Phasing is described in Section 5.22. Construction mitigation with respect to pedestrian access is provided in Section 7.8.2.

EEA-152: The DEIR should present a conceptual plan with a list of BMPs that could be selected by project contractors to reduce construction related erosion and sedimentation controls and air/noise pollution impacts for each project component. Erosion and sedimentation controls should be implemented and maintained in accordance with the Stormwater Pollution Prevention Plan prepared in accordance with the NPDES Construction General Permit requirements. The DEIR should also discuss potential construction-period dewatering activities and related permitting requirements.

Response: Section 7.10 includes a description of actions to reduce air quality impacts during construction. Section 7.17 provides the minimum BMPs to be included in the SWPPP for implementation by the contractor to prevent erosion and minimize sediment transport from the Project site during construction. If dewatering contaminated groundwater, then the contractor will apply under the Remediation General Permit. If dewatering is uncontaminated, then discharges will be covered under the NPDES Construction General Permit as an allowable non-stormwater discharge.

Section 5.10 describes potential air quality impacts of construction and demolition activities associated with the Project, as well as a description of mitigation measures to reduce those impacts. Noise and vibration associated with construction activities was assessed according to FTA and FHWA guidelines and local noise ordinances. The results of the construction noise and vibration assessment are presented in Section 5.11.7 and Appendix H, Noise and Vibration Analysis.

EEA-153: The DEIR should include a separate chapter summarizing proposed mitigation measures. This chapter should also include draft Section 61 Findings for each State Agency that will issue permits for the project. The DEIR should contain clear commitments to implement mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation, and contain a schedule for implementation. Local roadway improvements may be memorialized in future Transportation Access Plan Agreements (TAPAs) with the City of Boston, but should be identified in the DEIR due to the jurisdictionally-integrated roadway network in the study area. The DEIR should note the implementation schedule of mitigation measures based upon project phasing, either tying mitigation commitments to specific project elements or, most likely, traffic volumes and operations, to ensure that measures are in place to mitigate the anticipated impact associated with each development phase.

Response: The phasing of mitigation will be dependent on the selection of the Throat Area Variation and will be presented in the FEIR. General mitigation measures are provided in Chapter 7. The Draft Section 61 Finding in Section 7.21 provides potential mitigation measures for the Preferred Alternative and each Throat Area Variation. Once a Throat is selected, a Final Section 61 Finding will be prepared for the Project and presented in the Final Environmental Impact Report (FEIR).

EEA-154: To ensure that all GHG emissions reduction measures adopted by MassDOT in the Preferred Alternative are actually constructed or performed, MassDOT must provide a self-certification to the MEPA Office signed by an appropriate professional (e.g., engineer, architect, transportation planner, general contractor) indicating that all of the required mitigation measures, or their equivalent, have been completed as a condition of a Certificate approving an FEIR. The commitment to provide this self-certification should be incorporated into the draft Section 61 Findings included in the DEIR.

Response: The commitment to provide self-certification indicating that all of the required mitigation measures, or their equivalent, is included in Chapter 7 and in Draft Section 61 Findings in Section 7.21.

EEA-155: The DEIR should contain a copy of this Certificate and a copy of each comment letter received. In order to ensure that the issues raised by commenters are addressed, the DEIR should include direct responses to comments to the extent that they are within MEPA jurisdiction.

Response: A copy of the Certificate and comment letters are provided at the end of this chapter.

State and City Legislators (Leg)

Leg-1: The conversion of the former Beacon Park Yards (BPY) site into an MBTA commuter rail layover facility and the proposed MBTA West Station should be reviewed as part of the draft environmental impact report (DEIR). Noise and vibration impacts and mitigation for the neighborhoods adjacent to the rail yards and station need to be considered. West Station should have robust pedestrian, bike and public transit connection. To encourage mode shift, a location that maximizes connectivity should be selected. Future connections to the north and east may use the Grand Junction Railroad and the BU Bridge and both should be analyzed in the DEIR.

Response: Noise and vibration impacts are discussed in Section 5.11; mitigation is discussed in Section 7.11. See Section 3.2 for a description of West Station and the layover facility. Multiple shared-use path alternatives will provide pedestrian and bicycle accommodations to and from the south side of West Station. These alternatives include connections from Malvern and Babcock Streets, which are logical connection points as they each are continuations of the existing streets. See Section 5.7. Also see response to EEA-66.

Leg-2: Improved pedestrian and cyclist connections are a very important component of the project. The highway and BPY have prevented Allston and North Allston from connecting to each other, the river and the region. Multiple new pedestrian and cyclist connections should be evaluated in the DEIR: north-south, across the highway, connecting North Allston to Allston; east-west connecting the Allston to the river; and a multi-use path through the new development area should connect Allston, West Station, North Allston and the river.

Response: Section 5.7 describes the proposed north-south and east-west pedestrian and bicycle connections. Graphic 5.7-1 shows all of the proposed pedestrian and bicycle connections.

Leg-3: Moving Soldiers Field Road away from the river to reclaim green space is an important outcome for local residents. Exploration of different scenarios that maximize usable green space along the river should be studied in the DEIR. The expansion of parkland along the river is also needed to facilitate connections from the neighborhood to the river. Getting bikes and pedestrians across Soldiers Field Road will require more land area on the river side to accommodate the footprint of any new pedestrian bridge.

Response: Preferred Alternative 3K includes the depression and relocation of the SFR mainline to the west and provision of a new at-grade pedestrian/bicycle connection over SFR. See Section 3.1 and Section 5.7.

Leg-4: The DEIR study area should include the Charles River to assess the water quality impacts of the project.

Response: The quality of the runoff is regulated by the MassDEP Stormwater Management Standards. See Section 5.17 and Appendix M, Stormwater Management Technical Appendix.

Massachusetts DEP (DEP)

DEP-1: A description of the wetland resources on site and quantification of the extent of unavoidable wetland alteration to land under water, the bank of the Charles River, and within the Riverfront Area will need to be included in the EIR for the alternatives carried forward. The ENF acknowledges there is the potential for impacts to these wetland resources due to modifications to the stormwater outfalls and Soldiers Field Road, construction of both a bicycle and pedestrian overpass connecting the shared use path and the Dudley White path and a bicycle/pedestrian bridge over Soldiers Field Road, and expansion of the parkland along the river.

Response: Section 4.12 and Figure 4.12-1 characterize the existing state wetland-regulated resource areas within the Project Area. Section 5.12 and Figures 5.12-1 through 5.12-3 describe the impacts to state-regulated resource areas for each Throat Area Variation, including the storm drain discharge pipe replacement/relocations that will be the same for each variation. The impacts associated with the discharge pipe work will be de minimis and no mitigation is proposed. Impacts associated with the 3K-ABC Variation will require specific mitigation and conformance with performance standards for Land Under Water (LUW) and Bank as described in Section 5.12. If the 3K-ABC Variation is selected as the preferred variation, mitigation will be provided in the FEIR.

DEP-2: Plans at a readable scale should show the resource area impacts for the alternatives evaluated. The EIR should demonstrate that the preferred project alternative would comply with the performance standards in the wetlands regulations and explain how alterations to wetland resource areas have been avoided and minimized. Where opportunities exist, consideration should be given to site design changes to demonstrate fully that the project conforms to the wetlands regulations and impacts have been avoided and minimized to the extent feasible. MassDEP also requests plans depicting and quantifying wetlands replication areas and information on how altered wetland functions will be restored.

Response: Section 4.12 and Figure 4.12-1 characterize the existing state-regulated resource areas within the Project Area. Section 5.12 and Figures 5.12-1 and 5.12-3 describe and illustrate the impacts to state-regulated resource areas for each Throat Area Variation. Mitigation is discussed in Section 7.12. A discussion of conformance with performance standards for the 3K-ABC Variation for LUW and Bank is included in Section 5.12.

DEP-3: MassDOT has not conducted Chapter 91 historic license research for the project yet and the ENF asserts that more detail on impacts within jurisdictional tidelands will be forthcoming in the DEIR. After reviewing the ENF and the Chapter 91 Presumptive Jurisdiction map on Figure 6, it appears that portions of the project site are located on landlocked tidelands not subject to authorization, and some portions of the site along Soldiers Field Road are located on filled jurisdictional tidelands of the Charles River. Therefore, project-related work requires authorization through a Chapter 91 Waterways License.

Response: Sections 5.12.5 through 5.12.7 and Figure 5.12-4 through 5.12-7 discuss and show impacts to Chapter 91 Filled and Flowed Tidelands associated with the Preferred Alternative and each Throat Area Variations. Appendix I, Chapter 91 Historic Licenses and Legislative Authorizations, contains a list and copies of Chapter 91 Licenses, a plan showing the location of the Licenses, and legislative authorizations on and adjacent to the Project Area. Section 5.12.4 describes Project conformance with the performance standards. As noted in Chapter 6, the Project will require authorization through a Chapter 91 Waterways License.

DEP-4: The Department has determined that the proposed project is a nonwater-dependent infrastructure project pursuant to 310 CMR 9.55; therefore, the requirements of 310 CMR 9.51 through 9.53 shall not apply.

Response: Conformance with Standards for Nonwater-Dependent Infrastructure Facilities at 310 CMR 9.55 is provided in Section 5.12.7.

DEP-5: A portion of the project will include the shifting of Soldiers Field Road south under the proposed viaduct which will increase usable parkland within the Charles River Reservation and further buffer the existing Paul Dudley White Bike Path along the southern shore of the Charles River. This realignment begins west of the Grand Junction Railroad Bridge over Soldiers Field Road and ends east of the Soldiers Field Road underpass at River Street. This portion of the project appears to be mostly situated on filled jurisdictional tidelands of the Charles River and the WRP commends MassDOT for relocating the roadway away from the river's edge to accommodate additional open space and public access to the Charles River.

Response: In addition to the newly created open space noted above, the Project now proposes to relocate SFR away from the river and create a large amount of publicly accessible open space adjacent to the River. See Sections 5.12.5 through 5.12.7.

DEP-6: Stormwater runoff impacts during construction and post-construction should be evaluated in the EIR, and it should be demonstrated that source controls, pollution prevention measures, erosion and sediment controls, and the post-development drainage system will be designed in compliance with the MassDEP Stormwater Management regulations (SMR) and applicable performance standards for the project alternatives in consideration.

Response: MassDOT will continue to advance the development of the post-development stormwater design to provide the maximum reduction in phosphorous loading practicable. Compliance with the Massachusetts Stormwater Standards for runoff impacts for post construction are provided in Section 5.17 and Appendix M, Stormwater Management Technical Appendix. Construction-term stormwater management will be addressed in a Project-specific SWPPP to be developed in conjunction with final design.

DEP-7: The EIR also should explain how water quality and quantity impacts would be controlled in compliance with the performance standards for water quality and quantity impacts and the City of Boston's Storm Water Program.

Response: MassDOT has met with the BWSC regarding the proposed stormwater management system and incorporated their input into the proposed design. An analysis and description of these improvements is included in Section 5.17 and Appendix M, Stormwater Management Technical Appendix.

DEP-8: Calculations, stormwater system design plans at a readable scale, best management practice (BMP) designs, and supporting information should demonstrate that the stormwater system design provides adequate protection for wetland resources, including the Charles River, which is an impaired waterbody on the Category 4A and 5 lists in the Massachusetts Year 2014 Integrated List of Waters, June 2014.

Response: Preliminary stormwater BMP calculations and locations are provided in Appendix M, the Stormwater Management Technical Appendix. Potential locations for stormwater BMPs are provided on Figures 5.17-1 through 5.17-4 for the Preferred Alternative and each Throat Area Variation.

DEP-9: The ENF acknowledges that the Charles River (MA 72-36) from the Watertown Dam, Watertown to the Boston University Bridge, Boston/Cambridge is an impaired waterbody. According to the Massachusetts Year 2014 Integrated List of Waters, June 2014, impairments include fish-passage barrier, non-native aquatic plants, other flow regime alterations, Chlorophyll-a, DDT, Escherichia coli, fishes bioassessments, nutrient/eutrophication biological indicators, oil and grease, other, Oxygen, Dissolved PCB in fish tissue, pH (High), Phosphorus (Total), Secchi disk transparency, and sediment bioassays -- acute toxicity freshwater. There are total maximum daily loads (TMDLs), which address impairments due to phosphorus (total), nutrient/eutrophication biological indicators, Secchi disk transparency, and E.coli that should guide the design of the stormwater management system. The EIR should evaluate the project's stormwater management system for consistency with these TMDLs and for opportunities to minimize runoff impacts that would contribute to the impairments that require TMDLs. For impaired waterbodies, such as the Charles River, the NPDES General Permit requires measures and best management practices to control the discharge of the pollutants causing the impairment.

Response: Preliminary phosphorus and pathogen removal calculations are included in Appendix M, Stormwater Management Technical Appendix. For construction-term discharges, the NPDES CGP assumes that the implementation of BMPs (as required by the CGP) satisfies the criteria for addressing impairments and TMDLs in Project discharges to receiving waters. The SWPPP will include specific BMPs to control construction-term discharges typically associated with construction activities.

DEP-10: The ENF indicates that the imperviousness would be reduced by almost five acres, from 67 to 62.3 acres. Accordingly, the plan is to design the stormwater management system in compliance with the stormwater management regulations and performance standards for redevelopment projects. An analysis is needed in the EIR to substantiate the claim that Stormwater Standards at 310 CMR 10.05(6)(k) are met to the maximum extent practicable and improve existing conditions, pursuant to 310 CMR 10.05(6)(k)7 and 310 CMR 10.05(6)(o)(2).

Response: Compliance with the Massachusetts Stormwater Standards is discussed in Section 5.17 and Appendix M, the Stormwater Management Technical Appendix.

DEP-11: Also, in accordance with the wetlands regulations in 310 CMR 10.05(6)(o)(2), a complete evaluation of appropriate stormwater management measures for the project site is needed, including environmentally sensitive site design and low impact development techniques, structural stormwater best management practices, pollution prevention, and other applicable stormwater control measures. If this evaluation demonstrates that full compliance cannot be achieved, then it must be shown that the highest practical level of stormwater management is provided. This evaluation should be included as part of the alternatives analysis. Consideration of best management practices should be expanded beyond the measures identified in the ENF to include environmentally sensitive site design practices, low impact development techniques, and traditional structural treatment practices such as those proposed (page 9-36).

Response: Section 5.17 discusses the various BMPs based on the MS4 entity or owner of the system to which the Project will discharge. BMPs to address specific targeted pollutants are also described. A description of the proposed stormwater improvements is included in Section 5.17 and Appendix M, Stormwater Management Technical Appendix. For this Project, the feasibility and applicability of infiltration BMPs will be highly dependent upon site conditions with respect to contamination due to previous uses, depth to seasonal high groundwater, sufficient space, suitability of soils and limiting layers of clay/bedrock, all of which will influence and/or restrict the use of some BMPs such as infiltration. There are various alternative BMPs to address water quality, as discussed in Section 5.17; however, additional information with respect to site conditions must be known in order to evaluation and determine appropriate alternatives. Consideration of site constraints will be fully evaluated during final design and presented to the Boston Conservation Commission and MassDEP as part of the Notice of Intent filing. Figures 5.17-1 through 5.17-4 provide a comparative illustration of potential BMP locations for the Preferred Alternative and each Throat Area Variation.

DEP-12: The ENF indicates that microscale and mesoscale air quality analyses will be provided in the EIR to comply with the MEPA Greenhouse Gas Emissions Policy and Protocol. The MEPA GHG policy requires quantification of the project's GHG emissions and identification of measures that will be deployed to avoid, minimize, or mitigate those emissions.

Response: The mesoscale analysis includes a Project-related emissions inventory for CO_2. The GHG analysis quantifies the Project's GHG emissions and identifies mitigation measures to reduce those emissions. See Section 5.10 and the Air Quality and Greenhouse Gas Analyses in Appendix F and G, respectively.

DEP-13: The ENF includes numerous alternatives for the project compared on their relative basis to reduce congestion against a no-build analysis. The DEIR should quantify the additional GHG emissions that will be generated from increased vehicle congestion, which would result from a no-build alternative for comparison with the CO_2 generated by the alternatives carried forward including measures that will reduce congestion. This information should assist in making an informed choice of a Preferred Alternative.

Response: The mesoscale analysis includes a Project-related emissions inventory for CO_2. West Station, as a new rail and bus transit hub, will favorably shift mode share from motor vehicle to transit. Thus, the assumed TDM effect of the Project is to reduce CO_2 transportation emissions by approximately 7%. See Appendix F, Air Quality Analysis.

DEP-14: The EIR also will include an assessment of the project's contributions to reducing GHG emissions from a 1990 baseline, consistent with the target reduction of 7.6 percent established in the Clean Energy and Climate Plan for 2020. In addition, because the design year for micro- and mesoscale analyses is 2035, it would be appropriate to include an assessment of the 2050 target reduction of 12.3 percent, which is identified in MassDOT's GreenDOT Policy and Final GreenDOT Implementation Plan. MassDOT in its sustainability initiative, embodied in the GreenDOT Policy and Final GreenDOT Implementation Plan, has made commitments to achieve these reduction goals in transportation-related activities ranging from construction through operations, including promoting healthy transportation modes of walking, bicycling, and public transit, and supporting Smart Growth Development. Although not the MassDEP regulations remain to be finalized, these analyses also potentially could support MassDOT's demonstration of compliance with the 310 CMR 60.05(3)(3)(iii): Global Warming Solutions Act Requirements for the Transportation Sector and the Massachusetts Department of Transportation. These draft regulations offer a process for reporting and tracking GHG emissions reductions in transportation projects to assist the Commonwealth in achieving established goals for GHG emissions reductions.

Response: The DEIR presents that the net reduction of the Project's total CO_2 emissions is 19.8% compared to the Base Case. This advances MassDOT's GreenDOT Policy targeted reductions in transportation GHG emissions.

DEP-15: The alternatives' descriptions identify roadway configurations that will open up land to new development. There are readily available software tools that would allow for estimated build-out scenarios on the now accessible parcels. The GHG policy anticipates that at a conceptual development stage, estimation of GHG generation and potential mitigation options is appropriate. At a minimum, that evaluation should project the indirect emissions from vehicle miles traveled (VMTs) associated with some basic build-out scenarios. A similar exercise could also be considered for a limited number of alternative, mixed-use land developments as allowed and/or envisioned, ranging from a modest level of development to a maximum allowable.

Response: Harvard University owns most of the land that will be available for development by the Project. Such development is not part of this Project or under the control of MassDOT. Furthermore, any development on that land will presumably require its own permitting, including analyses of indirect emissions from VMTs and other emissions.

DEP-16: The ENF indicates that the DEIR will include microscale and mesoscale analyses of the highway components of the project for the Existing Condition, Build, and No Build for the 2020 completion year and 2035 design year. The proponent should consult with MassDEP to ascertain the appropriate MOVES model input files as necessary. The DEIR also will include an assessment of how the project will affect the Massachusetts Clean Energy and Climate Plan for 2020. MassDEP supports the provision of this assessment in the DEIR. The ENF indicates that the DEIR will not include mitigation scenarios as the "(p)roject will not directly result in the development of any new traffic generating projects."

Response: Appendix F, Air Quality Analysis, includes a microscale and mesoscale analysis. MassDEP approved the Air Monitoring Protocol submitted for the Project on May 12, 2015.

DEP-17: While the proponent distinguishes the project scope from future potential development around West Station, the proposed project design should take into account anticipated development in and around the project site and roadway considerations only as necessary to promote dense transit oriented development.

Response: MassDOT worked closely with the City of Boston, Harvard University and other stakeholders while developing the proposed street grid layout, and West Station access ways and bus station layout in order for the Project to be consistent with expected future development in the area. MassDOT established a Task Force comprised of representatives from MBTA, BU, Harvard University and members of the surrounding neighborhoods. The Task Force provided input and design guidance for the proposed street grid, blocks, roadways and access ways. MassDOT (and Harvard University) anticipates development in and around West Station to be largely consistent with that elsewhere on the campus and immediately adjacent to the Project site. Uses typical in this area include office, R&D, housing, educational facilities and neighborhood shopping uses. Consistent with the Purpose and Need of the Project, as a pedestrian and transit-oriented multi-modal station, parking for West Station would not be provided.

DEP-18: Future development will bring added pressure on the roadway and the 3J family of alternative path systems under consideration. The DEIR should address how the proposed project will provide for expanded multi-modal access to account for future growth.

Response: See Sections 3.1, 5.7, 5.8 and 5.9.

DEP-19: The proposed project is committed to direct bicycle and pedestrian connections to North Allston and the Charles River, and a yet to be determined, southward shift of a portion of Soldiers Field Road, creating additional parkland along Charles River. MassDEP strongly supports these project elements and urges the proponent to provide pathway amenities such as lighting and way-finding to promote bicycle and pedestrian access to West Station.

Response: See Section 5.7 for a description of the pedestrian and bicycle network. Details, such as lighting and amenities, will be developed as part of the final design.

DEP-20: The Paul Dudley Bicycle Path (DBP) currently serves as a major bicycle commuter route. Expansion of the DBP in the vicinity of the proposed project is constrained between the road and river. MassDEP supports a southward shift of Soldiers Field Road at a minimum to allow future expansion and amenities along this busy bicycle path.

Response: See Sections 3.1 and 5.7.

DEP-21: The DEIR should address the need to provide adequate capacity for future shuttle and transit vehicles connecting with West Station. At a minimum, the Station should be designed for adequate drop-off and pick-up locations, a secure weather protected bicycle cage for commuter parking, and a Hubway docking station. MassDEP supports the proponent's decision to create a "neighborhood" station, i.e., one without commuter parking supply.

Response: The West Station design has been advanced since the ENF. It incorporates a covered pick-up and drop-off area, adequate curb space for taxi, bus and shuttle service, adequate sidewalk space for bicycle cages, and a Hubway docking station. See Section 5.9.

DEP-22: The ENF identifies a potential future project that would connect the project to the Grand Junction corridor via the existing two track rail bridge over the Charles River to provide DMU service through Cambridge to North Station. The direct link between West Station via the Grand Junction railroad bridge over the Charles River offers tremendous opportunity to create vital connections between the proposed West Station, Kendall Square, and the new Lechmere Station. Such a project could provide substantial mode shift from driving to transit and yield commensurate regional air quality benefits. The DEIR should address how the proposed project design, at a minimum, maintains the feasibility, and advances the conceptual design of this future project.

Response: The Project design maintains the feasibility of this service. Considerations for potential future service demands are discussed in Section 3.2 and Section 5.9.

DEP-23: MassDEP recommends that the proponent work with its staff to implement construction-period diesel emission mitigation, which could include the installation of after-engine emission controls such as oxidation catalysts or diesel particulate filters. Additional information is available on the MassDEP website: http://www.mass.gov/dep/air/diesel/conretro.pdf. In addition, project contractor(s) are required to use ultra-low sulfur diesel (ULSD) fuel in their off-road construction equipment in conjunction with after-engine emission controls.

Response: Section 7.10.3 includes the requirements for contractors to follow for compliance with MassDEP's Diesel Retrofit Program (MDRP), which promotes the use oxidation catalysts or particulate filters, and with the State's Low Sulfur Diesel standards (301 CMR 7.05). This requirement will be included in the contract specifications.

DEP-24: MassDEP urges a project commitment to ensure compliance with the Massachusetts Idling regulation (310 CMR 7.11) which prohibits motor vehicle idling more than five minutes unless the idling is necessary to service the vehicle or to operate engine-assisted power equipment or other associated power.

Response: As discussed in 7.10.3, all construction equipment will be required to comply with 310 CMR 7.11 (1) (b), which requires that engines idle for no more than five minutes. This requirement will be included in the contract specifications.

DEP-25: The project includes demolition and construction which will generate a significant amount of construction and demolition (C&D) waste. The ENF includes a commitment to recycling as much demolition and construction debris as possible a sustainable measure for the project. In addition, the proponent is advised that if there is demolition, this work must comply with both Solid Waste and Air Pollution Control regulations, pursuant to M.G.L. Chapter 40, Section 54, which provides:

> "Every city or town shall require, as a condition of issuing a building permit or license for the demolition, renovation, rehabilitation or other alteration of a building or structure, that the debris resulting from such demolition, renovation, rehabilitation or alteration be disposed of in a properly licensed solid waste disposal facility, as defined by Section one hundred and fifty A of Chapter one hundred and eleven. Any such permit or license shall indicate the location of the facility at which the debris is to be disposed. If for any reason, the debris will not be disposed as indicated, the permittee or licensee shall notify the issuing authority as to the location where the debris will be disposed. The issuing authority shall amend the permit or license to so indicate."

For the purposes of implementing the requirements of M.G.L. Chapter 40, Section 54, MassDEP considers an asphalt, brick, and concrete (ABC) rubble processing or recycling facility, (pursuant to the provisions of Section (3) under 310 CMR 16.05, the Site Assignment regulations for solid waste management facilities), to be conditionally exempt from the site assignment requirements, if the ABC rubble at such facilities is separated from other solid waste materials at the point of generation. In accordance with 310 CMR 16.05(3), ABC can be crushed on-site with a 30-day notification to MassDEP. However, the asphalt is limited to weathered bituminous concrete, (no roofing asphalt), and the brick and concrete must be uncoated or not impregnated with materials such as roofing epoxy. If the brick and concrete are not clean, the material is defined as construction and demolition (C&D) waste and requires either a Beneficial Use Determination (BUD) or a Site Assignment and permit before it can be crushed.

Pursuant to the requirements of 310 CMR 7.02 of the Air Pollution Control regulations, if the ABC crushing activities are projected to result in the emission of one ton or more of particulate matter to the ambient air per year, and/or if the crushing equipment employs a diesel oil fired engine with an energy input capacity of three million or more British thermal units per hour for either mechanical or electrical power which will remain on-site for twelve or more months, then a plan application must be submitted to MassDEP for written approval prior to installation and operation of the crushing equipment.

Response: Solid waste and air pollution control permits and notification forms are noted in Table 6.1 in Chapter 6. This requirement will be included in the contract specifications.

DEP-26: In addition, if significant portions of the demolition project contain asbestos, the project proponent is advised that asbestos and asbestos-containing waste material are a special waste as defined in the Solid Waste Management regulations, (310 CMR 19.061). Asbestos removal notification on permit form ANF 001 and building demolition notification on permit form AQ06 must be submitted to MassDEP at least 10 working days prior to initiating work. Except for vinyl asbestos tile (VAT) and asphaltic-asbestos felt and shingles, the disposal of asbestos containing materials within the Commonwealth must be at a facility specifically approved by MassDEP, (310 CMR 19.061). No asbestos containing material including VAT, and/or asphaltic-asbestos felts or shingles may be disposed at a facility operating as a recycling facility, (310 CMR 16.05). The disposal of the asbestos containing materials outside the jurisdictional boundaries of the Commonwealth must comply with all the applicable laws and regulations of the state receiving the material.

Response: The management and disposal of asbestos-containing material will be conducted in compliance with solid waste regulations, as noted in Section 5.20 and Section 7.20. Demolition permits and asbestos notification forms are noted in Table 6.1 in Chapter 6. This requirement will be included in the contract specifications.

DEP-27: The demolition activity also must conform to current Massachusetts Air Pollution Control regulations governing nuisance conditions at 310 CMR 7.01, 7.09 and 7.10. As such, the proponent should propose measures to alleviate dust, noise, and odor nuisance conditions, which may occur during the demolition. Again, MassDEP must be notified in writing, at least 10 days in advance of removing any asbestos, and at least 10 days prior to any demolition work. The removal of asbestos from the buildings must adhere to the special safeguards defined in the Air Pollution Control regulations, (310 CMR 7.15 (2)).

Response: Air quality compliance, including asbestos management, is noted in Section 7.20. Demolition permits and asbestos notification forms are noted in Table 6.1 in Chapter 6. This requirement will be included in the contract specifications. Section 7.10 states that construction contractors will comply with a number of strictly enforceable mitigation measures during demolition activities to conform with current MA Air Pollution Control regulations governing nuisance conditions.

DEP-28: According to the ENF, there are 88 reported releases of contaminants on and near the project site. The ENF provides a list and brief explanation of the current status of the clean-up activities, pursuant to the MGL c.21E (Attachment 8). MassDEP advises the proponent that the reporting concentrations of contaminants have changed, which means that further investigation and characterization of the soils on sites with closed response action outcomes (RAO) may be needed. It also is recommended that the DEIR explain how contaminated soils will be excavated, stored, and disposed.

Response: It is anticipated that all currently active RTNs will be closed in accordance with current regulatory framework, including current standards. In areas where soils will be relocated to support the Project, they will be evaluated in accordance with the then-current regulatory standards, where warranted. Soil excavation and management protocols will be governed by construction sequencing, which will be developed during construction phase planning and informed by future testing in anticipated areas of disturbance. It is, therefore, premature to discuss details of soil management. However, as noted in Section 7.20, all soil testing and handling will be done in accordance with the then-current applicable regulations and policies.

DEP-29: The project proponent is advised that excavating, removing and/or disposing of contaminated soil, pumping of contaminated groundwater, or working in contaminated media must be done under the provisions of MGL c.21E (and, potentially, c.21C) and OSHA. If permits and approvals under these provisions are not obtained beforehand, considerable delays in the project can occur.

Response: Section 5.20 and Section 7.20 reference compliance with applicable MCP and related policies when managing OHM impacted media. The MCP incorporates OSHA compliance by reference. Therefore, Project planning will include obtaining appropriate permits and approvals, where warranted. This requirement will be included in the contract specifications.

DEP-30: The project proponent cannot manage contaminated media without prior submittal of appropriate plans to MassDEP, which describe the proposed contaminated soil and groundwater handling and disposal approach, and health and safety precautions. If contamination at the site is known or suspected, the appropriate tests should be conducted well in advance of the start of construction and professional environmental consulting services should be readily available to provide technical guidance to facilitate any necessary permits.

Response: Section 5.20 and Section 7.20 reference compliance with applicable MCP and related policies when managing OHM impacted media. The MCP incorporates OSHA compliance by reference. Therefore, Project planning will include obtaining appropriate permits and approvals, where warranted. Section 7.20 specifically references potential MCP tracking and management mechanisms, such as IRAs, RAMs, URAMs and other planning processes, as needed. Preliminary testing in areas of anticipated disturbance will be informed by the final design configuration.

DEP-31: If dewatering activities are to occur at a site with contaminated groundwater, or in proximity to contaminated groundwater where dewatering can draw in the contamination, a plan must be in place to properly manage the groundwater and ensure site conditions are not exacerbated by these activities.

Response: Dewatering proposed within existing disposal site boundaries will be conducted in accordance with 310 CMR 40.0000 to ensure that conditions are not exacerbated by construction. If dewatering contaminated groundwater, then the contractor will apply under the EPA's Remediation General Permit. If dewatering is uncontaminated, then discharges are covered under the EPA's NPDES Construction General Permit as an allowable non-stormwater discharge. Section 7.20 specifically references development of Soil Management Plans (SMPs) or Excavated Material Management Plans (EMMPs), both of which require discussion of management of groundwater recovered during dewatering processes.

DEP-32: Dust and/or vapor monitoring and controls are often necessary for large-scale projects in contaminated areas. The need to conduct real-time air monitoring for contaminated dust and to implement dust suppression must be determined prior to excavation of soils, especially those contaminated with compounds such as metals and PCBs. An evaluation of contaminant concentrations in soil should be completed to determine the concentration of contaminated dust that could pose a risk to health of on- site workers and nearby human receptors. If this dust concentration, or action level, is reached during excavation, dust suppression should be implemented as needed, or earthwork should be halted.

Response: see Response to DEP-30.

DEP-33: Construction activities conducted at a disposal site shall not prevent or impede the implementation of likely assessment or remedial response actions at the site. Construction of structures at a contaminated site may be conducted as a Release Abatement Measure if assessment and remedial activities prescribed at 310 CMR 40.0442(3) are completed within and adjacent to the footprint of the proposed structure prior to or concurrent with the construction activities. Excavation of contaminated soils to construct clean utility corridors should be conducted for all new utility installations.

Response: A range of measures proposed to manage hazardous materials during construction of the Project will be conducted in accordance with 310 CMR 40.0000. This is further detailed in Section 5.20. See also response to DEP-30. Material used for backfill in utility trenches will be suitable from an exposure point concentration (EPC) perspective for utility worker access in accordance with applicable sections of the MCP and related policies.

Massachusetts Historical Commission

MHC-1: The proposed project area includes a number of historic properties that are listed in the National and State Registers of Historic Places, including Soldiers Field Road and the Charles River Basin Historic District. Soldiers Field Road (BOS.9602) is listed in the National and State Registers of Historic Places as a contributing element of the Charles River Parkways District (BOS.YK). Also located within the overall project area are the Harvard Avenue Historic District and the Allston Depot Station, which are listed in the National and State Registers. In addition, there are numerous historic properties in the project vicinity that are included in the MHC's Inventory of Historic and Archaeological Assets of the Commonwealth. The EIR should include a complete list of historic properties and more detailed project maps or plans which depict the locations of the historic properties with respect to the proposed project impact areas.

Response: Existing historic resources are described in Section 4.6. MHC Inventory Forms are provided in Appendix E, Massachusetts Historic Inventory Forms. Proposed impacts to historic resources are discussed in Section 5.6 and shown on Figures 5.6-1 through 5.6-6 for the Preferred Alternative and each Throat Area Variation.

MHC-2: According to the ENF, the project will require review by the Federal Highway Administration (FHWA), the Federal Transit Authority (FTA) and the Army Corps of

Engineers (COE) in compliance with Section 106 of the National Historic Preservation Act (36 CFR 800) and the National Environmental Policy Act. The MHC looks forward to consultation with MassDOT, FHWA, FTA and Army COE and reviewing their determinations and documentation of the project's area of potential effects for historic and archaeological properties and their agency's determinations of effect pursuant to 36 CFR 800.

Response: MassDOT anticipates that FHWA, as the lead federal agency for the Project, will initiate consultation in compliance with Section 106 after the Throat Area Variation is selected and funding secured.

Massachusetts Department of Conservation and Recreation (DCR)

DCR-1: DCR has care, custody, and control over Soldiers Field Road in Allston, as well as the Charles River Reservation. The Project will require a DCR Construction and Access Permit. Overall, DCR believes the Project offers a rare opportunity to reclaim a section of parkland and transform an underutilized section of Boston.

Response: As shown in Table 6.1, the Project requires Construction and Access Permits from DCR.

DCR-2: DCR finds that the Proponent has done a thorough job of investigating alternatives to improve the current interchange and particularly, that the Proponent has used the opportunity of the necessary reconstruction of the viaduct section to relocate a substantial portion of Soldiers Field Road ("SFR") within the project area. Allston-Brighton, according to the City of Boston Open Space Plan, is one of the most underserved neighborhoods with approximately two-thirds the open space and recreational areas as the typical Boston neighborhood and much of its current parkland is poorly accessible across rail yards, industrial areas and busy roads and parkways. The addition of a new bicycle and pedestrian pathway between the Allston neighborhood and the riverside park will substantially improve the community's access to this parkland. DCR encourages the Proponent to continue to explore opportunities to expand this riverside parkland as suggested by others.

Response: See response to Open Space FAQ 1 and 2.

DCR-3: A widened reconstructed viaduct will overhang existing parkland, currently occupied by Soldiers Field Road. DCR expects the Proponent will further explore design elements to minimize or mitigate noise and shadow impacts on the expanded parkland and will assist the Proponent in its Section 4(f) assessment when conducted under the National Environmental Policy Act.

Response: MassDOT conducted a noise analysis following the MassDOT/FHWA and FTA procedures and guidelines, including the evaluation of noise on parkland. The results of the noise impact assessment are presented in Section 5.11 and in Appendix H, Noise and Vibration Analysis. Shadow impacts are discussed in Section 5.4 and in the Shadow Study in Appendix K.

DCR-4: DCR notes Soldiers Field Road is within the Charles River Basin National Register Historic District, but it is not identified as a contributing element. This omission was likely deliberate because the roadway has been altered numerous times, most recently in the early 1960s with adverse impacts to the parkland. While a riverside parkway, its current configuration detracts from the qualities that merited National Register listing for the larger district. By restoring and widening parkland along the river, the project will potentially enhance the historic qualities of the District.

Response: Comment noted.

DCR-5: The Project proposes two new ramps affecting Soldiers Field Road, an off-ramp from the inbound side of SFR north of Cambridge Street and an on-ramp, again on the inbound side of SFR, south of the intersection. While these ramps will likely improve operations of the Cambridge Street intersection and the overall proposed interchange, DCR expects that the traffic analysis will discuss in sufficient detail, the expected impacts to operations of SFR before the off-bound ramp and the anticipated impacts to the service road and its merge with the mainline by the addition of the on ramp.

Response: See response to EEA-56.

DCR-6: Similarly, DCR expects to review proposed storm water accommodations for the reconstructed Turnpike and interchange as well as Soldiers Field Road with particular attention to potential impacts to parkland, existing and proposed. DCR will work with the Proponent on this key Section 4F assessment.

Response: MassDOT will continue to coordinate with DCR through final design to develop designs that minimize impacts to parkland and associated Section 4(f) resources.

DCR-7: DCR notes that a Construction and Access Permit, to be issued by DCR, will be required for the Project and accordingly should be added to the list of required permits.

Response: As shown in Table 6.1, the Project will require a Construction and Access Permit from DCR.

Massachusetts Water Resources Authority (MWRA)

MWRA-1: The Proponent should include in the Draft Environment Impact Report a description of the existing drainage areas, existing and proposed stormwater collection system(s) and existing and proposed discharge location(s), to verify that site stormwater is not entering, and will not enter, the BWSC or MWRA sewer systems. Site investigations supporting the evaluation, planning or design of the storm water and sewer systems, should include the objective of finding any existing on-site sources of stormwater entering the sewer system or confirming the absence of these sources.

Response: BWSC and MWRA sewers were evaluated to determine whether stormwater is entering sewer systems. Corrective action will be included in the design to address these connections, although based on the current knowledge of the Project Area, none are anticipated to be encountered. Figures 4.17-1 and 4.17-2 show the existing conditions and watershed. Figures 5.12-1 through 5.12-3 show the locations of proposed storm water discharge pipes to be relocated, removed and/or retained.

MWRA-2: To ensure that the Project's new wastewater flow does not increase surcharging and overflows in large storms, the Proponent should work with BWSC to develop a plan to fully offset the Project's wastewater flows with infiltration and inflow ("I/I") or stormwater removal from the sewer system. Offset may be achieved in part by removing any existing on-site sources of stormwater that connect to the sewer system. The Project will have access to a storm drain and is not located in an area served by combined sewers. Therefore, the discharge of groundwater or stormwater to the sanitary sewer system during and after construction is prohibited.

Response: The Project does not include combined sewer systems.

MWRA-3: MWRA prohibits the discharge of groundwater to the sanitary sewer system, pursuant to 360 C.M.R. 10.023(1) except in a combined sewer area when permitted by the Authority and the Boston Water Sewer Commission. The project site is served by a separate storm drain system, and therefore, the discharge of groundwater to the MWRA sanitary sewer system associated with this project is prohibited. MassDOT must obtain coverage under the EPA NPDES Construction General Permit for Storm Water Discharges from Construction Activities.

Response: The Project does not include combined sewer systems. During construction, groundwater resulting from dewatering will be treated for sediment removal in portable sedimentation tanks or similar BMP and characterized. The contractor will obtain a BWSC Dewatering Discharge Permit and coverage under the EPA NPDES permit for stormwater discharges from construction activities. Depending on the characterization of the groundwater, pretreatment may be required prior to discharge to the drainage system. If dewatering contaminated groundwater, then the contractor will apply under the Remediation General Permit. If dewatering is uncontaminated, then discharges are considered an allowable non-stormwater discharge under the U.S. EPA's NPDES Construction General Permit.

MWRA-4: Section 8 (m) of Chapter 372 of the Acts of 1984, MWRA's Enabling Legislation, allows the MWRA to issue permits to build, construct, excavate, or cross within or near an easement or other property interest held by the MWRA, with the goal of protecting Authority-owned infrastructure. MWRA's concerns relate to the need to protect our existing water infrastructure in the vicinity of the project site, especially Sections 9, 2 and 3, WASM4, and Shaft 8 of the City Tunnel Extension. Because of the close proximity of the Project site to these MWRA facilities, an MWRA 8(m) permit may be required.

Response: MassDOT will apply for an 8(m) permit that will include detailed plans and profiles of existing MWRA water and sewer mains that cross the Project Area. Protective measures, supports and monitoring measures will be incorporated into the construction documents. There is a 64-inch MWRA water pipe that crosses from Buick Street and runs beneath the Charles River. The depth to the top of this pipe is relatively shallow below the railroad and SFR and then transitions to deeper below grade. There is also a MWRA brick sewer that runs parallel to SFR in the Throat Area that may be impacted by the Throat Area Variations. This is discussed further in Section 5.18 and shown in Graphics 5.18-1 through 5.18-3 for each Throat Area Variation.

MWRA-5: MWRA encourages the Proponent to submit more detailed plans to MWRA in order to avoid impacts to the existing water infrastructure.

Response: MassDOT will continue to coordinate with MWRA through final design and permitting.

Massachusetts Port Authority (Massport)

Massport-1: Currently, taxicabs and buses (including Massport's Back Bay-Logan Express shuttle) use the existing reverse/U-turn directional loop ramp to travel from I-90 westbound to I-90 eastbound. Will the preferred design accommodate this movement as efficiently or will this movement be accommodated through an improvement done in MassDOT's Boston I-90 Ramps Study?

Response: The existing U-turn function will be available with the Preferred Alternative. This maneuver will require drivers to go through 3 traffic signals. Appropriate signage will be developed during the design phase to guide westbound drivers through the interchange to reverse direction.

Massport-2: Massport continues to enhance HOV/shared-ride/transit access to Logan Airport. The I-90 Allston Interchange Project may open up HOV opportunities.

Thus, we request that MassDOT work with Massport to explore this concept.

Response: MassDOT looks forward to working with Massport to identify future HOV opportunities at the Allston Interchange/West Station.

Massport-3: We look forward to a continuing engagement on the Allston I-90 Interchange Multimodal Transportation Project as it proceeds. Please include Massport on future project distribution lists.

Response: Massport will be included on future distribution lists.

Boston Transportation Department/Boston Redevelopment Authority (BTD/BRA)

BTD/BRA-1: Establish strong connections to surrounding neighborhoods.

Response: The street pattern in the Preferred Urban Interchange Alternative connects to the neighborhood to the north and to future planned development beyond. Separated bike lanes and sidewalks connect the neighborhoods to the south to the north through West Station. See Sections 5.2 and 5.7.

BTD/BRA-2: Connect existing and new neighborhoods to the Charles River while expanding the area's open space.

Response: See response to Open Space FAQ 1 and 2.

BTD/BRA-3: Establish a human scale street grid as the foundation for a new, walkable neighborhood.

Response: See Sections 5.2, 5.3, 5.4 and 5.7.

BTD/BRA-4: Maximize the potential for mixed-use, transit-oriented development.

Response: See Section 3.1.

BTD/BRA-5: Design a pedestrian oriented public realm.

Response: See Sections 5.2, 5.3, 5.4 and 5.7.

BTD/BRA-6: Make bus and other transit connections integral to the new design.

Response: See Section 5.8 and 5.9.

BTD/BRA-7: Create multi-modal access to West Station.

Response: West Station has been designed to meet the purpose of creating a multimodal commuter rail station servicing the Allston/Brighton area for this neighborhood. The site was selected due to its proximity to other modes of transit including the Green Line along Commonwealth Avenue. Provision of space for MBTA buses, a Kiss-and-Ride, pedestrian and bicycle access, and easy on/off access from the station to I-90 for commuter and intercity bus travel, increases the opportunities for passengers to utilize multiple modes of travel from this nexus. See Section 3.1 and 5.9.

BTD/BRA-8: Follow the City's Complete Streets Guidelines in all street design.

Response: Cambridge Street and Cambridge Street South were developed following the City's Complete Street Guidelines. The north/south connectors allow for separated bicycle and pedestrian travel as well. See Sections 3.1, 5.2, 5.4, 5.7 and 5.8.

The streets are wide to accommodate vehicular use, but sidewalks and separated bicycle lanes are separated from vehicular use on Cambridge Street and Cambridge Street South with street tree plantings. As the area is developed, new buildings will help to define street edges and create more human scale, and smaller connector streets will be designed to be of a comfortable scale. See Section 5.3.

BTD/BRA-9: Redesign and revitalize Cambridge Street.

Response: See Section 5.4.

BTD/BRA-10: Increase climate resiliency.

Response: Section 4.19 discusses existing conditions; Section 5.19 provides the inundation vulnerability assessment for Preferred Alternatives and three Throat Area Variations. Section 7.19 provides a discussion of potential protective resiliency mitigation measures associated with climate change.

BTD/BRA-11: Comply with MassDOT's GreenDOT criteria in all transportation systems and infrastructure design.

Response: The GreenDOT Implementation Plan provides the framework for incorporating sustainability principles to MassDOT's business practices, with three primary objectives: (1) reduce greenhouse gasses; (2) promote healthy transportation options including bicycling, public transit and walking; and (3) support smart growth development. For a discussion on greenhouse gas reduction, see Section 5.10 and Appendix G, Greenhouse Gas Analysis. The Project design includes an extensive internal network of proposed sidewalks, separated bike paths and a commuter rail station, thereby addressing the second principle of the GreenDOT Implementation Plan. Lastly, Harvard University, the land development stakeholder in the Project, has demonstrated apparent commitment to Smart Growth practices through their coordination with Boston development review procedures.

BTD/BRA-12: First, our strong preference is for alternative 3J-3, which introduces a new two-way roadway parallel to (and south of) Cambridge Street. We believe that this alternative offers to greatest potential for establishing a traditional neighborhood street grid and block pattern and establishes the best framework for walkable, mixed used, transit oriented development.

Response: See response to EEA-18 and Chapter 3.

BTD/BRA-13: Additionally, we would recommend that Cambridge Street and the new parallel street be designed to accommodate conversion to a one-way pair, should that be deemed appropriate at some future point.

Response: MassDOT will make every effort to develop a design for Cambridge Street and Cambridge Street South that will allow for a conversion to one-way operations in the future, should it be beneficial.

BTD/BRA-14: Urban Street Character: The highway access system (i.e., on- and off-ramps) as much as feasible should be conceived and designed as a human scale urban street system.

Response: The number of travel lanes on the I-90 ramps are the result of a thorough regional traffic analysis. On local streets such as Cambridge Street and Cambridge Street South, sidewalks and separated bicycle lanes are separated from vehicular use with street tree plantings. As the area is developed, new buildings will help to define street edges and create more human scale, and smaller connecting streets can be designed to be at a comfortable scale. See Sections 5.2 and 5.3 for discussion and graphics.

BTD/BRA-15: Human-Scale Street Network: Allow potential for a new, human-scaled street and roadway network which maximizes opportunities for walkable, multi-modal streets, consistent with the City's Complete Street Guidelines, as shown here: http://bostoncompletestreets.org/.

Response: See Response to BTD/BRA-8.

BTD/BRA-16: Phasing of Roads to be Built "by Others": To properly manage multi-modal traffic and circulation, and to mitigate potentially adverse traffic impacts on local neighborhoods, the proposed new streets "by others", including Stadium Way and East Street, should be built simultaneously with the new interchange project, including identifying whose responsibility building the streets should be.

Response: With Preferred Alternative 3K, Stadium Way, Cattle Drive, East Drive and Hotel Drive area will be constructed by Harvard University by the 2040 Design Year. A 2025 Opening Year roadway network was analyzed that only assumes construction of East Drive (north of the North Connector) by Harvard, with the balance of the roadways constructed by MassDOT. The traffic analysis results for the Opening Year network indicates that the roadways and intersections will function adequately. See Section 5.8.2.3 and Appendix C, Traffic Operations Study.

BTD/BRA-17: Length of On- and Off-Ramps: In order to maximize the extent of a traditional street grid with intersections, curb cuts, and walkable street frontage, the length of on- and off-ramps to I-90 should be minimized.

Response: The length of the proposed I-90 off-ramps were based on the need to be able to store the 95th percentile queues on the ramps without queues backing-up onto the I-90 mainline, and in order to provide safe highway deceleration lengths in accordance with AASHTO guidelines. On-ramp lengths were developed in order to provide safe and efficient lane drop/merge distances on the ramps prior to the traffic entering the I-90 mainline traffic stream. See Section 3.1 and Section 5.8.2.

BTD/BRA-18: Elevation of On Ramps: The elevation of the on ramps should also be minimized, possibly by depressing the main turnpike itself or adjusting the location of the bridges which connect over the Turnpike to service West Station.

Response: Elevation of the eastbound on ramp has been minimized as a result of "flipping" the I-90 overpass further to the west from East Drive to Cattle Drive (formerly Stadium Way), as described in Section 3.1.

BTD/BRA-19: Easternmost Street/On Ramp: The easternmost street/on ramp should be located as far away from the Charles River as possible, maximizing the opportunity for open space and real estate development potential.

Response: The location of the easternmost street is directly related to the location of West Station and to eastbound traffic operation on the proposed roadway immediately south of I-90. The Project expands parkland along the Charles River. It greatly improves accessibility to that parkland through the creation of an at-grade pedestrian/bicycle crossing from the sidewalk and cycle track on the north side of Cambridge Street South. See Section 5.4.

BTD/BRA-20: Access to West Station from the South: Access to West Station from the south side (for instance, Babcock Street, Malvern Street, and Alcorn Street) should reinforce the existing street network in terms of logic, clarity, and flow.

Response: See response to EEA-66.

BTD/BRA-21: Pedestrian and Bicycle Accommodations Leading Up to West Station: The current alternatives present the pedestrian and bicycle accommodations as an integral part of both the on ramps leading to the Turnpike and further extending over the layover facility to the proposed new station. We have serious concerns about incorporating pedestrian and bicycle facilities into conventional expressway facilities and would urge consideration of alternative design approaches for pedestrian and bicycle accommodations in these areas.

Response: A number of alternatives were considered, but the Preferred Alternative 3K plan was determined to be the most practicable option to make the pedestrian/bicycle connections between Cambridge Street and West Station. Traffic entering/exiting the highway will be controlled by traffic signals on the eastbound ramps and those signals will include pedestrian phases. The proposed street sections include sidewalks and bicycle accommodations. Neither of these design features are present on conventional expressway facilities. See Section 5.9.

BTD/BRA-22: Location of West Station: The station should be located as far east as possible to minimize noise and other impacts on the nearby residential neighborhood.

Response: Section 3.2 and Appendix A, Rail Yard and West Station Alternatives Analysis, evaluate various locations for West Station. The Preferred Alternative locates the station as far to the east as is practicable while allowing for satisfactory yard leads and track switches to support future service expansion via the GJR branch should MassDOT/MBTA choose to do so.

BTD/BRA-23: Scale of West Station: It is still not clear what the goal of the new West Station design is in terms of the scale and scope. Is the station a major transit hub, along the lines of Forest Hills Station or Ruggles Station, or is it intended to be more like Yawkey Station? Greater clarity on this issue is essential for understanding the nature and character of streets, pedestrian and bicycle pathways leading to the station.

Response: As a relative measure of comparison, West Station is envisioned to operate more like Forest Hills Station than like Yawkey Station. West Station will include a covered busway to serve MBTA and other transit or shared ride users.

BTD/BRA-24: Exclusive Bus Accommodations on New Streets: The next phase of design needs to plan for the location of dedicated bus service routes along the proposed new streets from North Allston to West Station. See Graphic Insert 10-1 in Section 5.3.4.

Response: MassDOT has been working with MBTA Bus Operations Staff to evaluate future service to West Station. It is expected that there will not be any MBTA bus service to West Station until such time as there is sufficient new development to spur ridership needs in the Project Area. MBTA bus operations will grow into the station as future development occurs throughout the district. See Section 5.9.3.

The proposed facility that is best suited to perform this function is Stadium Way. Stadium Way will not be constructed by MassDOT, but by Harvard University sometime after 2025. If the City and Harvard determine that designating all or part of that facility for transit vehicles only is the optimal use for the roadway, it is certainly within their prerogative to do so when it is constructed.

BTD/BRA-25: Transit Capacity & Responsibility: If West Station is truly to become a major transit hub; if neighborhood around the Station is to be truly transit-oriented; and, if sustainable, non-automobile mode share goals are to be achieved, then a more comprehensive study of how bus and other transit connections will be made must be conducted in the next phase of design.

Response: The Project, as it was initially proposed by MassDOT, would replace a functionally obsolete viaduct structure that is aging and costly to maintain. At the same time, with the pending implementation of All Electronic Tolling, the then-existing toll infrastructure as well as the Allston/Brighton interchange would become obsolete. This provided an opportunity for MassDOT to both realign the highway and shrink the roadway network. West Station was not part of the initial Purpose and Need. Its inclusion within this Project is the result of community input. MassDOT is committed to constructing West Station as a commuter rail facility, providing the possibility of implementing Urban Rail service at some future date. Likewise, MassDOT will construct a bus access loop with berths dedicated for the exclusive use by MBTA local bus service. Implementation of any bus service will be provided by the MBTA over time. The MBTA is not prepared to develop a comprehensive study of how bus and transit connections will be made in the future, as that will be determined after development by others. The station itself has been conceived to support arrival of buses along two routes on headways as frequent as five minutes. See Section 5.9.3.

BTD/BRA-26: Alignment of Shared Use Path to the Charles River: We strongly support situating the proposed shared use path to the Charles River along the new street parallel to Cambridge Street as opposed to along the northern edge of the Turnpike.

Response: The Preferred Interchange provides a strong pedestrian/bicycle connection along the north side of the Cambridge Street South alignment between the neighborhood and the PDW Path. See Section 5.7.

BTD/BRA-27: Neighborhood Traffic Management and Mitigation: As expressed by neighborhood stakeholders and members of the Task Force, we believe that the project is bound to have traffic and circulation impacts not only on the North Allston neighborhood immediately to the north but also on the Allston-Brighton Center and area around the intersections of Cambridge Street, Linden Street and Harvard Avenue. We recommend that attention be given to analyzing these impacts and developing any and all appropriate multi-modal traffic management and mitigation strategies as possible to preserve the livability of this neighborhood.

Response: The 2025 and 2040 traffic analysis performed for this DEIR indicate that the proposed roadway network will function adequately and, consequently, there will not be a need for drivers to ”short-cut’ through the North Allston neighborhood. In fact, with the proposed alternative, because of the provision of new north-south roadways such as Stadium Way and Cattle Drive, traffic volumes on North Harvard Street are expected to be approximately 34% (19%) less in the 2040 AM (PM) peak hours as compared to 2015, even with the assumption of 7 million new square feet of Harvard development. Any future traffic increases on Harvard Avenue or Linden Street will be related to other new developments in the area (e.g., New Balance) and not the Project.

Traffic impacts could occur during the construction phase, and MassDOT will work with the City and the community to develop a Construction Management Plan that minimizes disruption to the community during construction of the interchange improvements.

BTD/BRA-28: Maximize Development Potential: The new Turnpike roadways and infrastructure should be designed with an eye toward maximizing developable land to allow the creation of a new neighborhood.

Response: See Section 5.2.

BTD/BRA-29: Significant elevations and elevation changes for on ramps and new streets should be minimized. Elevation can adversely compromise the quality, walkability and legibility of the streetscape and public realm and can adverse effects on real estate viability.

Response: See Response to EEA-17. Also, the Project was designed to minimize elevation differential to favor pedestrian and bicycle travel. See Section 5.2.

BTD/BRA-30: Enlivening Vacant Land: Once the new interchange and system of new streets is built, from day one every consideration should be given to landscaping and/or activating vacant land in the project area with temporary uses (a good example is the “Lawn on D” on the South Boston Waterfront), in order to avoid creating a desolate landscape until development arrives in the future.

Response: The most significant change in land use within the Project Area will be the creation of developable parcels through the removal of the existing I-90 Interchange and the construction of an urban street network within the same area. This discussion is provided in Section 5.2.

BTD/BRA-31: Character and Quality of New Streets: All new streets need to be designed and built as “Complete Streets” according to the City of Boston Complete Street Guidelines, including landscaping and street furniture, so that they will be immediately comfortable and inviting to pedestrians and cyclists.

Response: See response to BTD/BRA-8. Also see Sections 5.3, 5.4 and 5.7.

BTD/BRA-32: Urban Design and Real Estate Market Feasibility Analyses: The project Scope of Work for the remaining phases of design must include: a) an analysis of the most suitable street, block pattern, and open space layout from a real estate market perspective, exploring how to maximize value and economic feasibility; b) a study of the urban design strategies that will produce the highest level of livability and real estate market value; and c) a study of additional, supplemental streets and roadways needed to create the best possible neighborhood.

Response: The Project responds to the criteria set forth in the I-90 Allston Interchange Placemaking Study developed for the City. See Chapter 3.

BTD/BRA-33: Noise Mitigation: We urge MassDOT to consider all means of noise mitigation along the edge of the redesigned Turnpike and West Station, and particularly with the introduction of a new multi-modal station adjacent to a residential neighborhood.

Response: See Response to EEA-80.

BTD/BRA-34: Quality of open space along edge of Charles River: The greatest land and real estate value is in visual and physical access to the Charles River. Significant attention should be paid to maximize open space and views along the river.

Response: The Project expands available opens space along the Charles River with the westerly shift of SFR. It greatly improves accessibility to the parkland through the creation of an at-grade pedestrian/bicycle crossing from the sidewalk and cycle track on the north side of Cambridge Street South. See Sections 5.4 and 5.7. Open space and recreation views of the river vary in the alternatives (See Section 5.3).

Views from the Cambridge side to the Throat Area vary between the three Throat Area Variations. The 3K- HV Variation provides the most amount planting area along the river edge, but also the highest viaduct. The 3K-ABC Variation has no viaduct, but no planting area at the river edge. The view will be of the at-grade roadways. The 3K-AMP Variation has a view of the lower rail viaduct, and less planting at the river edge than the 3K- HV Variation.

BTD/BRA-35: Climate Resiliency: Both the I-90 Interchange design and the roadway and infrastructure systems that is designed to establish the foundation for a new neighborhood should be designed with every consideration to sea level rise and climate resiliency; particularly given the proximity of the Charles River.

Response: See response to BTD/BRA-10.

BTD/BRA-36: As we have stated, we applaud MassDOT's public outreach efforts and the significant ways in which the agency has listened and incorporated public comments into the project design. Because we believe the Task Force role has been invaluable, we urge MassDOT to continue to provide stakeholders and Task Force members with a substantive role through the remainder of the planning and design process.

Response: See Section 9.3 regarding the extensive public process and involvement.

BTD/BRA-37: In addition to the community at large, we cannot overstate the importance of continuing to engage the key stakeholders of Harvard University and Boston University going forward. We urge an active, engaged and substantive role of Task Force members and these major stakeholders in the planning and design process.

Response: See response to Public Outreach Efforts FAQ 1.

Boston Water and Sewer Commission (BWSC)

BWSC-1: The proponent must submit to the Commission detailed plans for the proposed I-90 Allston Interchange and the West Station Layover Yard projects. The plans must show all existing and proposed public and private water mains, sanitary sewers and storm drains on the project site and on adjacent roads and easements. The plans must show the locations of all existing and proposed service connections. To assure compliance with the Commission's requirements, the proponent should submit the plans to the Commission for review when the design for the project is at 50% complete.

Response: Figures 4.17-1 through 4.18-1 show existing stormwater management and utilities. Figures 5.17-5 through 5.17-7 show existing stormwater management with an overlay for each Throat Area Variation. Figures 5.17-4 through 5.18-3 show the proposed stormwater management and utilities. Design drawings will include existing and proposed public and private water mains, sanitary sewers and storm drain and tie in locations on and adjacent to the Project Site. The plans will be submitted to the Commission for review at the 50% design stage. MassDOT will continue to coordinate with BWSC through final design.

BWSC-2: The project is expected to include a train car wash facility, commute / pedestrian uses at West Station, and quarters for the crews; however, no estimates for domestic water demand are provided in the ENF. Estimates for sanitary wastewater and industrial wastewater are included in the ENF. With the project plans the proponent will be required to provide detailed estimates for water demand, wastewater generation and storm water runoff for project.

Response: Maintenance facilities, including the car washing facility, are no longer proposed as part of the Project. Only light maintenance not requiring heavy equipment or facilities would occur at the rail yard, consisting of activities such as trash removal, internal car cleaning and refueling. The domestic water demand and sanitary sewer estimates will be provided in a detailed format to the Commission during the design phase. The expected water consumption and wastewater generation are provided in Table 5.18-1 through 5.18-3 for Rail Operations. Stormwater hydrologic modeling is provided in Appendix M, Stormwater Management Technical Appendix.

BWSC-3: It is the proponent's responsibility to evaluate the capacity of the water and sewer systems serving the project to determine if the systems are adequate to meet future project demands. With project plans the proponent must include a detailed capacity analysis for the water, sewer and drainage systems serving the project, as well as an analysis of the impact the project will have on the Commission's systems and the MWRA's sewer system overall.

Response: A capacity analysis for water, sewer and drainage will be provided to the Commission during the design phase.

BWSC-4: Any new or relocated water mains, sewers and storm drains required for this project must be designed and constructed at the proponent's expense. They must be designed and constructed in conformance with the Commission's design standards, Water Distribution System and Sewer Use Regulations, and Requirements for Site Plans.

Response: New and relocated water mains, sewers and storm drains required for this Project will be designed and constructed by MassDOT in conformance with the Commission's design standards, Water Distribution System and Sewer Use Regulations and Requirements for Site Plans. MassDOT does not fund construction of utility infrastructure, including water and sewer, on behalf of future private developers or municipalities. MassDOT will include construction of this work as part of the Project with funding provided by others. MassDOT will fund and construct the complete stormwater system for Project operations in conformance with the applicable design requirements.

BWSC-5: Developers of projects involving disturbances of land of one acre or more are required to obtain an NPDES General Permit for Construction from the Environmental Protection Agency. The proponent is responsible for obtaining the permit. A copy of the Notice of Intent and the pollution prevention plan submitted to EPA pursuant to the permit must be provided to the Commission's Engineering Services Department prior to the commencement of construction.

Response: Coverage under the EPA's NPDES General Permit for Construction from the U.S. EPA will be obtained by both MassDOT and the contractor upon their respective Notice of Intent Filings with the EPA. A copy of the Notice of Intent and SWPPP will be provided to the Commission's Engineering Services Department prior to the commencement of construction. Note: only Notices of Intent are filed with EPA; copies of the SWPPP are not required to be submitted.

BWSC-6: A Total Maximum Daily Load (TMDL) for Nutrients has been established for the Lower Charles River Watershed by the Massachusetts Department of Environmental Protection. In order to achieve the reductions in phosphorus loadings required by the TMDL, phosphorus concentrations in stormwater discharges to the lower Charles River from Boston must be reduced by 64%. To accomplish the necessary reductions in phosphorus, the Commission is requiring developers of projects in the lower Charles River watershed to infiltrate all stormwater discharging from impervious areas. The Proponent will be required to submit with the site plan a phosphorus reduction plan for the proposed project.

Response: A description of the Project's stormwater management system and measures to reduce phosphorus and infiltrate stormwater are included in Section 5.17 and Appendix M, Stormwater Management Technical Appendix.

BWSC-7: The design of the project must comply with the City of Boston's Complete Streets Initiative, which requires incorporation of "green infrastructure" into street designs. Green infrastructure includes greenscapes, such as trees, shrubs, grasses and other landscape plantings, as well as rain gardens and vegetative swales, infiltration basins, and paving materials and permeable surfaces. The proponent must develop a maintenance plan for the proposed green infrastructure. For more information on the Complete Streets Initiative see the City's website at http://bostoncompletestreets.org/.

Response: A menu of potential BMPs is provided in Section 5.17. Also, see response to BTD/BRA-8.

BWSC-8: The proponent is responsible for ensuring that the proposed project does not negatively impact the Commission's water, sewer and storm drain facilities. Prior to commencing the project, the proponent must submit to the Commission detailed plans indicating the location of the water, sewer and drain facilities relative to the proposed construction and related staging areas. The plans must also identify specific measures that will be implemented to prevent damage or obstruction of the water, sewer and drain facilities during construction.

Response: Existing BWSC water, sewer and stormwater facilities within the Project Area are shown on Figure 4.17-1. Detailed, scaled 50% engineering plans will be provided to the Commission for review. Sections and profiles are provided that show the facilities relative to the project design where the facilities will not be negatively impacted. Specific measures required to prevent damage to facilities will be detailed on the final plans, sections and profiles. MassDOT will coordinate with BWSC during final design to be responsive to their review requirements.

BWSC-9: All Commission owned water pipes, sewers and drains, as well as related manholes must be accessible to the Commission during construction. The project must be designed so that access, including vehicular access, to the Commission's facilities for the purpose of operation and maintenance is not inhibited after construction is complete. The proponent will be required to establish a written plan and agreement with the BWSC in this regard.

Response: Access to the BWSC-owned water, sewer and drainage systems and manholes will be maintained during construction. MassDOT will coordinate with BWSC during final design to include their access and other requirements in the construction specifications for both construction- and operation-term.

BWSC-10: The Department of Environmental Protection (DEP), in cooperation with the Massachusetts Water Resources Authority (MWRA) and its member communities, are implementing a coordinated approach to flow control in the MWRA regional wastewater system, particularly the removal of extraneous clean water (e.g., infiltration/ inflow (I/I)) in the system. In this regard, any new connection or expansion of an existing connection that exceeds 15,000 gallons per day of wastewater shall assist in the I/I reduction effort to ensure that the additional wastewater flows are offset by the removal of I/I. Currently, a minimum ratio of 4: 1 for I/I removal to new wastewater flow added is required. The Commission supports the DEP/MWRA policy, and will require the proponent to develop a consistent inflow reduction plan. The 4:1 reduction should be addressed at least 90 days prior to activation of water service, and will be based on the estimated sewage generation provided on the project site plan.

Response: The Project will generate less than 15,000 gallons per day of wastewater in conjunction with station and layover facilities. The Project does not include combined sewers.

BWSC-11: The site plan must show in detail how drainage from the project site will be conveyed and managed. Stormwater runoff must be conveyed separately from sanitary waste at all times. Under no circumstances will stormwater be allowed to discharge to a sanitary sewer.

Response: The CCTV investigation was used to identify cross-connections between the sewer and drainage systems. The results were used to eliminate cross-connections identified. Stormwater connections to sanitary waste will not be allowed as part of the Project. A description of the proposed stormwater management system is included in Section 5.17 and Appendix M, Stormwater Management Technical Appendix. MassDOT will coordinate with BWSC during final design to be responsive to its design and submission requirements.

BWSC-12: The proponent must fully investigate methods for retaining and infiltrating stormwater onsite. The feasibility assessment must be submitted with the site plan for the project and the site plans must show where and how stormwater runoff from impervious surfaces will be infiltrated.

Response: A description of proposed infiltration measures and potential limitations is included in Section 5.17 and Appendix M, Stormwater Management Technical Appendix. MassDOT will coordinate with BWSC during final design to be responsive to its design and submission requirements. As noted in Section 5.20, to inform stormwater management system design, MassDOT will conduct the appropriate assessments, such as mounding analyses and modeling, to evaluate the feasibility of assimilating hydraulic load and also evaluate the potential for significant remobilization of OHM in subsurface media due alteration of stormwater infiltration patterns.

BWSC-13: The Commission expects that Green Infrastructure and stormwater Best Management Practices will be incorporated into the project design. Design plans for GI/BMP facilities included in the project must be included with the site plans for the project.

Response: The Project proposes several BMPs and green infrastructure techniques throughout the Project Area. The use of both surface and subsurface features is proposed to the maximum extent practicable. Compliance with the Massachusetts Stormwater Standards is detailed in Section 5.17 and Appendix M, Stormwater Management Technical Appendix. MassDOT will coordinate with BWSC during final design to be responsive to its design and submission requirements. Also see response to BTD/BRA-8.

BWSC-14: The Massachusetts Department of Environmental Protection (MassDEP) has established Performance Standards for Stormwater Management. The Standards address stormwater quality, quantity and recharge. In addition to Commission standards, the proposed project will be required to meet MassDEP's Stormwater Management Standards to the extent they apply.

Response: A description of the stormwater features, design calculations and pollutant removal rates is included in Section 5.17 and Appendix M, Stormwater Management Technical Appendix.

BWSC-15: In conjunction with the project plans the proponent will be required to submit a Stormwater Pollution Prevention Plan. The plan must:

- Specifically identify how the project will comply with the Department of Environmental Protection's Performance Standards for Stormwater Management both during construction and after construction is complete.
- Identify specific best management measures for controlling erosion and preventing the discharge of sediment, contaminated storm water or construction debris to the Commission's drainage system when construction is underway.
- Include a site map which shows, at a minimum, existing drainage patterns and areas used for storage or treatment of contaminated soils, groundwater or stormwater, and the location of major control or treatment structures to be utilized during construction.

Response: For construction-term storwmater management, as required by the EPA NPDES Construction General Permit, a SWPPP will be prepared. The SWPPP will identify specific BMPs for managing stormwater, prevention erosion and controlling erosion during construction. The SWPPP will include a site map that shows, at a minimum, existing drainage patterns and areas used for storage or treatment of contaminated soils, groundwater or stormwater, and the location of major control or treatment practices to be utilized during construction. MassDOT will coordinate with BWSC during final design to be responsive to design and submission requirements. The SWPPP will be submitted to BWSC prior to construction.

BWSC-16: The discharge of dewatering drainage to a sanitary sewer is prohibited by the Commission. The discharge of any dewatering drainage to the Commission's storm drainage system will require a Drainage Discharge Permit from the Commission. If the dewatering drainage is contaminated with petroleum products for example, the proponent will be required to obtain a Remediation General Permit from Environmental Protection Agency (EPA) for the discharge.

Response: The Project's construction documents will specify that discharge of any dewatering to the Commission's storm drainage system will require a Drainage Discharge Permit from the Commission. The construction documents will also specify the responsibilities of treatment of dewatering and associated permitting.

As noted in Section 7.20, application for an NPDES RGP is listed as an option in the event OHM impacted groundwater is collected and treatment and discharged is identified as the preferred management option.

BWSC-17: The Commission requests that the proponent install a permanent casting stating: "Don't Dump: Drains to Charles River" next to any new catch basin installed as part of the project. The proponent may contact the Commission's Operations Division for information regarding the purchase of the castings.

Response: Castings stating: "Don't Dump: Drains to Charles River" will be installed next to new catch basins. Refer to Section 5.17.1.

BWSC-18: The Commission encourages the proponent to explore additional opportunities for protecting storm water quality by minimizing sanding and the use of deicing chemicals, pesticides and fertilizers.

Response: The discussion of minimization of sand and salt on roadways and the use of deicing chemicals, pesticides and fertilizers will be incorporated into the "Stormwater Management System Operations and Maintenance Plan and Long-Term Pollution Prevention Plan." Maintenance of the proposed street grid will be under City of Boston jurisdiction.

BWSC-19: The proponent is required to obtain a Hydrant Permit for use of any hydrant during construction of the project. The water used from the hydrant must be metered. The proponent should contact the Commission's Metering Department for information on obtaining a Hydrant Permit.

Response: The requirement to obtain a Hydrant Permit and to meter the flow will be incorporated into the construction documents.

BWSC-20: The Commission utilizes a Fixed Radio Meter Reading System to obtain water meter readings. Where a new water meter is needed, the Commission will provide a Meter Transmitter Unit (MTU) and connect the device to the meter. For information regarding the installation of MTUs, the proponent should contact the Commission's Meter Installation Department.

Response: The Fixed Radio Meter Reading System will be specified in the construction documents. The engineer will contact BWSC's Meter Installation Department to obtain the MTU model and installation procedures.

City of Cambridge Community Development Department (CCD)

CCD-1: In scoping the traffic analysis supplied by the project team and Central Transportation Planning Staff, please include the analysis of signals on Memorial Drive at River and Western bridges, with the goal of attaining a coordinated 90 second cycle for the four signals at River and Western, on each side of the river. Based on analysis done during the River and Western Bridge designs, this would allow for some improvements to coordination of this signal system, benefiting vehicles and reducing wait times for path users. A high pedestrian level of service should be included and a process begun with the Department of Conservation and Recreation to agree on management of the signal system.

Response: The traffic analysis in Section 5.8 includes the intersections of Memorial Drive with River Street and Western Avenue. Signal timings, cycle lengths and signal coordination parameters will be finalized during Project design, and MassDOT will coordinate the signal design with the DCR, BTD and the City of Cambridge.

CCD-2: Access to the site would be greatly improved by implementing final or temporary bicycle and pedestrian enhancements to the River and Western bridges. The Cambridge Street and Soldiers Field intersection road lacks basic infrastructure such as curb cuts and cross-walks which should be installed as part of a package of immediate, temporary measures.

Response: MassDOT has an interim improvement project that will enhance pedestrian/bicycle accessibility at the intersections of the SFR Frontage Road with Western Avenue and River Street, including providing curb cuts and crosswalks at River Street. Refer to Section 5.7. Enhancements to the River Street and Western Street bridges over the Charles River are not within the scope of this Project, but are within the scope of planned projects to be implemented in the future by MassDOT.

CCD-3: We support the analysis of the accommodating both a multi-use path and future DMU service on the Grand Junction. We are concerned that mandating two tracks on the Grand Junction right of way could preclude a multi-use path which has broad public support. The analysis should also include identifying space for the People's pike multi-use path to cross the Charles River and connection with the Grand Junction path. MIT has just completed a feasibility study showing how such a path could be accommodated in the right of way now owned by MIT which extends close to the Charles River.

Response: See Response to Pedestrian and Bicycle FAQ 2.

CCD-4: The addition of as much new green space and parkland along the Charles River as possible, as well as moving Soldiers Field Road and the Mass. Turnpike viaduct away from the river, will enhance the experience of those using the river paths for transportation and recreation. Every effort should be made to not create additional impacts by widening the cross-section of the turnpike in this area, given that a widened turnpike with breakdown lanes does not continue into the downtown Boston. This will help maximize park space.

Response: See response to Open Space FAQ 1 and 2.

CCD-5: The City is greatly concerned that noise impacts on the Cambridgeport neighborhood from any new facility, including during construction, be thoroughly analyzed and mitigated as this neighborhood is extremely close to the project area and sensitive to noise that easily crosses the river. The noise study should look at all potential sources of noise and provide multiple potential ways that the project should mitigate it.

Response: Since publication of the ENF, MassDOT expanded the noise Study Area to include noise sensitive locations in Cambridgeport including Magazine Beach, Morse Elementary School and residences north of Memorial Drive, such as Granite Street, Florence Street, Tufts Street, Glenwood Avenue and the Riverside area north of River Street. This study includes all sources of noise including roadway, rail and construction. The measurement sites are described in Section 4.11, the results of the Noise Study in Cambridgeport are presented in 5.11 and Appendix H, Noise and Vibration Analysis.

CCD-6: The project should involve the nearby neighborhoods in Cambridge in a proactive way in all aspects of the project including all phases of design and construction.

Response: The City of Cambridge has three representatives on the Task Force: Henrietta Davis, a resident of Cambridgeport and former Mayor, and two members of the City planning/transportation staff, Bill Deignan and Susanne Rasmussen.

CCD-7: The West Station design as included in the ENF needs to be better integrated into the site so that use of the station is a central part of the transportation strategy. Access to the station for bicycle and pedestrians should be designed so that users are not subject to a long trip on an isolated, bridge type structure crossing vehicle traffic from the Turnpike, access roads and rail storage yards. Every effort should be made to integrate development along these connections, including decks or foundations for air rights developments over the rail tracks and highway.

Response: See response to EEA-66 for West Station access. Access to the station will be integral to the street grid. Street cross sections are similar in dimensions and general appearance with accommodation of pedestrians and bicyclists within the street grid and on the approaches to the station. See response to EEA -7 for air rights development and Sections 5.3.5 and 5.7.

CCD-8: High quality path connections should be provided from the “People’s Pike” path to the Grand Junction crossing and a future path along that corridor.

Response: Reconstruction of the GJR Bridge over the Charles River to accommodate bicycles is beyond the Project scope, however, the Project will not preclude the construction of a future pedestrian and bicycle connector ramp from the PDW Path to the GJR approach to the bridge. See Section 5.7.4.

CCD-9: Multiple access points to the Turnpike from Western Ave and Soldiers Field Road would be useful to all modes and reduce the number of vehicles going through the Soldiers Field Road/Cambridge Street intersection, helping to reduce the cycle length.

Response: The Project will include alternative routes between Western Avenue and the I-90 ramps so those drivers do not have to pass through the intersection of Cambridge Street/SFR. In the Opening Year, this includes East Drive (by others). In the Design Year, it also includes Cattle Drive and Stadium Way (also by others). See Section 5.8.2 and Appendix C, Traffic Operations Study.

A new westbound off-ramp from SFR to the most easterly connector in the street grid to I-90 is included in Preferred Alternative 3K. The existing westbound off-ramp from SFR to Cambridge Street will be removed, which will help to reduce the cycle length and improve operations at the SFR/Cambridge Street intersection.

CCD-10: The location of crossings for cyclists and pedestrians to BU should inform where connecting streets are placed leading to Cambridge Street as this will be an important connection for the Allston neighborhood and Harvard. The lack of a transit vehicle connection to the Commonwealth Avenue area should also be reviewed since this would provide important service. If such a connection is not feasible, then other methods of creating efficient bus circulation that avoid congested areas should be planned.

Response: Connectors for pedestrian and bicycle travel between Cambridge Street and BU are integrated with West Station to provide the highest multi-modal utility. See Sections 5.7 and 5.8.2. Section 5.8.2 also includes an analysis of a potential transit (bus) connection to Commonwealth Avenue. See also Appendix C, Traffic Operations Study.

CCD-11: We support the project team’s suggestion that all roads have bicycle facilities and sidewalks, with cycle tracks on more major streets. Having cycle tracks will have an impact on signal timing, especially for turning cyclists, and this should be accounted for in the design. Separate bicycle signals, like the one Cambridge recently installed on Western Avenue in Cambridge, should be included to facilitate turns.

Response: A determination on bicycle signals will made during the design phase in consultation with the BTD.

CCD-12: Raising streets above the grade of parcels should be avoided or at least minimized.

Response: Street grades are designed to minimize grade changes to the extent feasible. Table 5.4-1 shows slope variations between major connector streets.

CCD-13: In the Secretary’ certificate, MEPA should carefully outline all elements that mitigate past and currently proposed conditions, and that will insure that this new neighborhood will be fully supported by sustainable modes and will serve as a model to future development. To this end, in addition to including the measures, the Secretary should also require that the project Task Force continues meet at least quarterly to review project designs until final designs are complete.

Response: MassDOT is aware of the desire for ongoing public involvement and remains committed to a thorough and comprehensive public involvement process as it works to process the input it expects to receive on the DEIR. The agency will continue to seek ways for both the Task Force members and the broader community to help guide the agency’s efforts as it advances the replacement for the I-90 Allston Interchange and its aging viaduct through the FEIR and beyond to final design and construction.

Metropolitan Area Planning Council (MAPC)

MAPC-1: MAPC respectfully requests that the DEIR include a detailed analysis of the following project components:

- Inclusion of new bicycle/pedestrian connections which provide east-to-west and north-to-south access.
- Inclusion of new bicycle/pedestrian connections along Cambridge Street.
- Construction of a shared-use pathway that provides a more direct connection from the area of Cambridge Street and Lincoln Street to the Charles River and the existing Paul Dudley White Bicycle Path. This connection should include a new bicycle/pedestrian bridge over Soldiers’ Field Road.
- Provision of a bicycle/pedestrian connection from the Babcock Street Station access point to the Paul Dudley White Bicycle Path at Soldiers’ Field Road.
- Pedestrian, bicycle, and vehicular access from the Boston University West Campus area at Malvern Street and Babcock Street.
- Maintenance of the pedestrian and bicycle facility that crosses I-90 immediately west of the Cambridge Street overpass.

Response: East-west and north-south bicycle and pedestrian connections are included in the Preferred Alternative along Cambridge Street South, over SFR to the PDW Path. See Chapter 5.7.

A pedestrian/bicycle connection from Babcock Street, through West Station to Cambridge Street South, over SFR, connecting to the PDW Path is included in the Project and will be provided when West Station is constructed. A pedestrian/bicycle connection from Malvern Street to Cambridge Street South is also included in the Project and will be provided when the highway improvements are constructed. The Franklin Street Bridge crossing over I-90 west of the Cambridge Street overpass will be replaced and continue to make this connection. See Section 3.1 and Section 5.7.

MAPC-2: MassDOT has stated in the ENF that providing a bicycle and pedestrian connection from the Paul Dudley White Path to Cambridge via the Grand Junction Railroad Bridge is outside of the project scope. MAPC respectfully requests that this connection be included, and that the DEIR examine the following alternatives: a) bicycle and pedestrian access over the existing upriver span of the Grand Junction Bridge, while existing rail service is maintained on the downriver span; and b) construction of a new bicycle and pedestrian bridge, either freestanding or cantilevered off the existing rail bridges, that would allow for bicycle and pedestrian access along with two-way rail access. The DEIR should also address how bicycle and pedestrian access along the Grand Junction Rail corridor to North Station would be affected if a Diesel Multiple Unit (DMU)-type service were added.

Response: Bicycle and pedestrian accommodation on the GJR Bridge is outside the Project scope and would be undertaken by others. The DEIR traffic study area includes three intersections on the Cambridge side of the Charles River and the intersection of Cambridge Street/Harvard Avenue located west of the Project Area. The Project Area extends east to the GJR Bridge, but does not include reconstruction of that structure. However, the Project will not preclude future reconstruction of the GJR Bridge as a rail facility or a combination rail/pedestrian/bike facility.

The DEIR includes descriptions of improved connections between the Project and nearby neighborhoods including: re-purposing the existing SFR westbound exit ramp to Cambridge Street to an enhanced bike/pedestrian path and open space/landscaped area; and a depressed SFR section with at-grade bridge connecting bike/pedestrian traffic from North Allston to the PDW Path.

MAPC-3: The extent to which roadway, bicycle, and pedestrian connections are able to access West Station from Cambridge Street, and particularly from Commonwealth Avenue and Brighton Avenue.

Response: See response to EEA-66 and Sections 3.1, 5.7 and 5.8.2.4.

MAPC-4: Evaluation of opportunities to provide “kiss & ride” areas where cars can drop-off and pick-up rail passengers in the vicinity of the station as well as access and accommodations for shuttles, taxis, and other ride-sharing vehicles.

Response: Kiss-and-Ride accommodations were incorporated into the preliminary station design to the north as part of the bus loop concourse designs, as shown in Section 5.9. A Kiss–and-Ride is not proposed from the South due to restricted space available in this neighborhood.

MAPC-5: Evaluation of bus routes serving West Station from both north and south, including alternatives that would re-route existing buses or add new routes. In particular, the DEIR should evaluate the opportunity for a new circumferential route connecting points to the north, such as Harvard Square or Kendall Square, through West Station to points south, such as the Longwood Medical Area, Ruggles, or Dudley Square. Proposed alternative roadway configurations in the project area should be evaluated for their ability to support such future bus services.

Response: See Section 5.9.3 and Appendix L, Ridership Forecast Technical Report, for West Station bus route assumptions.

MAPC-6: Analysis of whether the physical design of West Station has enough capacity to accommodate the projected service level, under existing conditions and future land use development assumptions. The analysis should also address whether West Station has the capacity to accommodate the AM and PM peak loading summaries for the Framingham/Worcester Commuter Rail line outlined in the South Station Expansion Project’s DEIR.

Response: West Station is designed to accommodate projected passenger flows under 2040 Design Year conditions. Commuter rail ridership projections and an analysis of projected vehicle loading on the Worcester/Framingham Commuter Rail Line trains are summarized in Section 5.9.3.

MAPC-7: Will the estimated number and frequency of commuter rail stops anticipated to take place at West Station be coordinated with the projected service for Boston Landing and Yawkey Station?

Response: Worcester Main Line commuter rail operating assumptions, including stops at Boston Landing, West Station and Yawkey Station, are summarized in Appendix L, Ridership Forecasting Technical Report. For planning purposes, trains assumed to stop at West Station in the 2040 Design Year would also stop at Boston Landing and Yawkey Station.

MAPC-8: What are the anticipated headways if a DMU-type service along the Grand Junction Rail corridor to North Station is implemented? Will the inclusion of such a service affect the ability of commuter rail trains to stop at West Station?

Response: The analysis of potential DMU services is outside the scope of this Project. The proposed West Station and BPY layover site are designed to not preclude potential usage of the GJR ROW for DMU service.

MAPC-9: Anticipated future growth will spur the need for additional public transit service in the project area. The DEIR should address increased demand for public transit. Specifically, the DEIR should examine the extent to which bus connections, re-routing of bus routes, and new bus stops can be located in and around the project area in order to maximize their usage, and to provide connections to West Station from both north and south.

Response: See response to MAPC-5.

MAPC-10: MAPC is pleased to read that pedestrian and bicycle accommodations will be included for all three design alternatives under consideration for Cambridge Street (Two-way Directional Street Alternative, One-way Parallel Street Alternative, and Two-way Parallel Street Alternative). However, the DEIR should also address the extent to which traffic on Cambridge Street can be calmed and serve all modes of travel for each of the three design alternatives. MAPC recommends that MassDOT advance a design alternative for Cambridge Street that minimizes the number of lanes for vehicular travel and maximizes the availability of accommodations for bicyclists and pedestrians as well as open space.

Response: See response to comment EEA-18. See Section 3.1 and Section 5.7. Traffic on Cambridge Street decreases with the elimination of the SFR westbound exit ramp to Cambridge Street and by the proposed SFR westbound ramp connection to Cambridge Street South. The Cambridge Street design includes separated bicycle lanes and sidewalks.

MAPC-11: A portion of Soldiers’ Field Road is proposed to be relocated to the south, away from the Charles River. MAPC strongly supports this element of the Project, as the parkland and bicycle/pedestrian facilities in this area are extremely narrow and inadequate. MAPC encourages MassDOT to evaluate the extent to which this portion of Soldiers’ Field Road could be realigned to extend as far north as possible toward the River Street Bridge.

Response: See response to Open Space FAQ 1 and 2 and Section 5.4.

MAPC-12: The DEIR should include analysis that addresses the extent to which Soldiers’ Field Road could be realigned as far south/west as possible, in order to create maximum additional parkland along the Charles River and the Paul Dudley White Bicycle Path. This analysis should cover the area extending between the BU Bridge and the River Street Bridge.

Response: See response to Open Space FAQ 1 and 2 and Section 5.4.

MAPC-13: The future land development in the project area is a significant issue. The development potential of the project area should be maximized and accessed by a well-designed new local street grid. MAPC strongly recommends that MassDOT solicit the services of an architecture/urban design firm(s) to advise them on the implications of development configurations on the roadway designs currently under review.

Response: The Project responds to the criteria set in the I-90 Allston Interchange Placemaking Study developed for the City, and the street grid creates a framework for a future mixed-use neighborhood. See Section 5.2. Since the filing of the ENF, MassDOT has added Crosby, Schlessinger and Smallridge to the Project’s design team.

MAPC-14: It is imperative that the new interchange configuration be designed to minimize the impact on local roadways in the surrounding neighborhoods. Any new street configuration must avoid inducing cut-through traffic in the surrounding neighborhoods (e.g., on Harvard Avenue, Linden Street, North Harvard Street, Seattle Street, Sorrento Street, and Windom Street).

Response: See response to comment BTD/BRA-27.

MAPC-15: The scope for the DEIR should direct MassDOT to consult with the City of Boston, the Department of Conservation and Recreation (DCR), MAPC and the Allston Interchange Improvement Project Task Force. All parties should be given an opportunity to collaborate and provide feedback as part of the analysis of future land use assumptions.

Response: Land use assumption for the CTPS modeling are detailed in a memoranda provided in Appendix C, Traffic Operations Study (Technical Appendices C-2 and C-3), and include future regional socio-economic projections for employment, population and household from MAPC and local agencies like the BPDA. Also see also Section 5.2.

MAPC-16: MAPC is encouraged that MassDOT acknowledges the design of the I-90 Allston Interchange may have a significant effect on the future development of the area. Accordingly, MassDOT has committed to develop future land use development assumptions which will be used in several analyses in the DEIR. These analyses will include a traffic analysis and an analysis of the potential social and economic effects of the project. In addition, MassDOT needs to include a mode share analysis (vehicles, commuter rail, bus, bicycling, and walking) as part of the land use development assumptions. This analysis should take into account the impact new multimodal infrastructure and transportation management efforts will have on single occupancy vehicle trips. According to the ENF, the transportation analysis, to be performed by CTPS, will examine existing travel patterns and future 2035 No Build and Build alternative transportation conditions. Transit ridership and service data will be collected, and information on future private development on the project site will be identified based on Harvard University Allston developments and data from the Boston Redevelopment Authority (BRA) for use in developing forecasts. However, the ENF is unclear as to what the transportation model’s annual growth rate is. The background growth rate and assumptions used need to be clearly delineated in the DEIR (e.g., will the growth rate be compounded).

Response: The DEIR includes mode share projections from the CTPS modeling for the 2040 Design Year and 2025 Opening Year scenarios. The CTPS modeling includes regional transit network improvements that are in the LRTP and expected to be operational by 2025 or 2040. Data regarding the resulting transit and traffic growth rates are provided in the DEIR. See Section 5.9.3 and Appendix C, Traffic Operations Study.

MAPC-17: MassDOT has committed to construct a noise barrier to mitigate rail noise impacts along the south side of the commuter rail tracks. A combined highway traffic noise, transit noise, and vibration study will also be conducted to identify whether additional mitigation measures may be warranted. In addition, the DEIR should include an evaluation of decking options over portions of the rail yard and/or highway in the vicinity of West Station, in the areas closest to residential neighborhoods on Wadsworth and Pratt Streets, or both. The inclusion of decking as part of this Project has the potential to promote pedestrian, bicycle and bus access to West Station in addition to increasing safety, improving aesthetics, as well as mitigating noise and air pollution. In addition, appropriately designed decking can reduce future development costs. MAPC respectfully requests that MassDOT include an evaluation of decking scenarios with cost estimates in the DEIR.

Response: See response to FAQ Future Development/Decking/Utilities.

MAPC-18: The DEIR should address the proposed designated miles per hour speeds for I-90, Cambridge Street, and all new streets once the project is completed and the All Electronic Tolling system is in place.

Response: The CTPS model includes assumptions for facility free-flow speeds for modeling purposes. Posted speed limits on existing facilities, such as I-90, will not change due to this Project. Speed limits for the new ramp system and local roadways will be developed during the design phase, and where appropriate, in consultation with the BTD. Posted speed limits will be established following completion of construction in accordance with MassDOT P*rocedures for Speed Zoning on State and Municipal Roads.*

MAPC-19: Although the ENF states that MassDOT does not intend to provide local parking for station patrons, the ENF mentions there will be an increase of 70 parking spaces. Where are these parking spaces proposed to be located, what is their intended use, and how was the number of spaces determined?

Response: The 70 spaces in the ENF were for MBTA employees working at the BPY. With the reduction in scope of BPY activities, the number of spaces was reduced to 20.

MAPC-20: MAPC recommends that MassDOT develop and commit to conducting a transportation monitoring program following project completion. Performance measures should be clearly defined for vehicular travel, public transit, walking, and bicycling. This information will be critical to determine whether the project has been effective in meeting its anticipated outcomes. The results from a monitoring program will provide guidance for project refinements. Specifically, vehicular traffic should be monitored along I-90 and vehicular, bicycle, and pedestrian utilization should be monitored along Soldiers' Field Road and Cambridge Street. In addition, modes of access to and from West Station should be monitored. Monitoring should be conducted annually for a period of three years.

Response: See response to comment EEA-44 and Section 7.8.2. MassDEP maintains a statewide network of monitoring stations that continuously measure pollutant concentrations in the ambient air to assess compliance with the NAAQS and the MAAQS and to evaluate the effectiveness of pollution control strategies. Monitoring stations located at Kenmore Square and Dudley Square (Harrison Avenue) are the closest, most representative MassDEP monitors to the Project.

MAPC-21: The DEIR needs to include a Greenhouse Gas Emissions (GHG) analysis as well as a detailed analysis of potential air quality impacts of the project. The air quality analysis needs to address both highway air quality and transit air quality components of the project. The analysis should indicate which elements of the project might result in increased emissions, as well as those that will contribute to a decline. Net impacts should then be calculated to determine appropriate mitigation. It is important to note that the Commonwealth has a statutory obligation to reduce GHG by 25% from 1990 levels by 2020 and by 80% from 1990 levels by 2050.

Response: The DEIR assesses Project-related air quality impacts from both highway and transit, including greenhouse gases, and presents a description of potential mitigation measures. See Section 5.10 and the Air Quality and Greenhouse Gas Appendices F and G, respectively.

MAPC-22: To date, the Allston Interchange Improvement Project Task Force, which represents numerous neighborhood and community groups, has provided significant and valuable feedback for the shaping of this project. MAPC supports many of the design elements and enhancements which have been identified by the Task Force as presented in the ENF. MAPC strongly recommends that the Task Force continue to convene and provide input on selecting final design alternatives for the I-90 Interchange and Cambridge Street.

Response: See response to Public Outreach Efforts FAQ 1.

Harvard University (HU)

HU-1: Harvard has valued its participation in the Task Force process as well as the contributions made by the Task Force in achieving these results. Therefore, Harvard recommends that MassDOT continue to look to the Task Force during the design phase of the project to provide feedback in advance of key design milestones and decisions.

Response: See response to Public Outreach Efforts FAQ 1.

HU-2: The project site (which at present, is defined to encompass 150± acres), is not a "blank slate" but rather, an area in flux and one for which future private development plans have yet to be determined. The project is planned to be constructed on land Harvard purchased from the former Massachusetts Turnpike Authority over a decade ago. Moreover, the project site has already been the subject of significant private investment that will yield public benefits in the years to come, including environmental assessment, the relocation of certain CSX Transportation, Inc. rail functions from the area, and the planned removal of most of the rail encumbrances on the land. Because of Harvard's ownership of the project site, MassDOT and the MBTA will need to acquire from Harvard, easement rights over portions of the project site (in which Harvard will also have retained rights), in order to build the project. The remainder of the project site will remain unencumbered, Harvard-owned land.

Response: Comment noted. The proposed City of Boston street grid will be easements/in fee granted in negotiations with Harvard. Likewise, the re-aligned Soldiers Field Road and the created open space east of SFR will be owned in fee by DCR. The legal details for rights required by the MassDOT for rail and highway purposes will be established with Harvard.

HU-3: The project site is unique in that it is a part of Boston in which there is the opportunity to plan for a thoughtfully-developed neighborhood that takes advantage of its proximity to existing neighborhoods, the Charles River waterfront, and existing transportation infrastructure, as well as the new transportation services to be planned around West Station. Thus, it is critical that the project be designed to optimize, not hinder, such transit-oriented future development. Specific examples of design elements that should be considered include the following:

HU-3a: MassDOT's design and construction of streets that can be part of a new urban grid;

Response: The Project responds to the criteria set in the I-90 Allston Interchange Placemaking study developed for the City, and the street grid creates a framework for a future mixed-use neighborhood. See Section 5.2. The proposed street grid has been developed in coordination with and endorsed by Harvard, BPDA, and the Task Force. See Sections 3.1 and 5.8.

HU-3b: Designs for the project infrastructure that will make possible future construction of the underground infrastructure (e.g., water, sewer and utility lines) that will be needed to support such development;

Response: The design, including installation location and sizing of infrastructure in the proposed streets, will be coordinated with Harvard.

HU-3c: The design of project elements such as the rail yard and highway, that will maximize the feasibility and viability of air rights development. The highway and rail facilities, in particular, should be designed with appropriate horizontal and vertical clearances and preapproved means and methods for construction to facilitate the construction, by others, of air rights development projects;

Response: As the Project design progresses, MassDOT will continue to coordinate with Harvard University to advance designs that allow for future overbuild. A preliminary column layout was established throughout the rail yard to leave ample foundation areas to support the anticipated future air rights development. Utilities are proposed outside of the future column foundations. Crew quarters would be located in consideration of future air rights and meet minimum vertical clearances. See Section 5.18 for utility information. In sum, the Project will not preclude future air rights development. Also see responses to FAQ Future Development/Deck/ Utilities and EEA-7.

HU-3d: The location of the vertical transition area to bring I-90 from the viaduct to grade. MassDOT should shift the vertical transition area as far to the east as possible to maximize the urban development potential that this project has the ability to unlock. The relocation of the vertical transition area further to the east would reduce the clearance height over the highway at the eastern end of the site near East Drive.

Response: The 3K concept achieves the desired eastward shift of the vertical transition on I-90. Urban development potential in the easternmost parcels is maximized as a result of the shift.

HU-3e: The carefully-considered location of major underground utilities (including the relocation and/or replacement of existing obsolete utilities such as the existing stormwater drainage system) can create the opportunity to lower the grade of the proposed rail facility and reduce the associated height clearances. This would in turn, increase the viability of air rights development over the rail facility.

Response: MassDOT is developing a utility layout for West Station and BPY that will efficiently supply needed services in designated locations. MassDOT is mindful of the desire to lower the rail yard to the extent feasible and is developing utility plans that anticipate lowering the train yard. See Section 5.18 for utility information.

The existing rail and interstate drainage systems will be abandoned or removed and new systems will be constructed. The Charles River remains the discharge location for the new drainage system and as a result, the depth of the system is constrained by the elevation of the river. Rail and highway infrastructure elevations should not be lowered below the elevation required for the systems to flow by gravity and to pass through water quality treatment structures.

HU-4: Careful location of the vertical transition and the major underground utilities could also have the additional benefit of (i) reducing the grade of the north-south roadways that need to cross over the highway and the rail facility for connections to West Station, and (ii) creating more amenable site conditions during the interim period before future development is undertaken.

Response: See response to HU-3d. The grades of the north-south connectors are lower than the grades presented in the ENF because I-90 has been shifted south, thereby increasing the distance between Cambridge Street and the I-90 overpass bridges, resulting in a more gentle slope.

HU-4a: The potential future air rights development in this area is critical to maximizing, from design through construction, the contribution this area can make to regional economic vitality. Therefore, the project must ensure future air rights that are both technically feasible and economically viable. Such air rights development, particularly over the planned rail layup/layover facility, may itself help to ameliorate some of the negative noise and air pollution effects of the project. The Draft Environmental Impact Report (DEIR) should evaluate all site constraints and design elements that might affect such air rights development.

Response: MassDOT understands and is committed to developing West Station and BPY in consideration of the technical and economic effects on future air rights development. Section 5.2 includes consideration of site constraints and design criteria that are supportive of future air rights. Also see responses to FAQ Future Development/Decking/Utilities and EEA-7. The Project will not preclude future air rights development.

Appendix F, Air Quality Analysis, includes proposed mitigation measures that will reduce air quality impacts associated with the Project. The air dispersion analyses include West Station and BPY layover area, but do not include projected air rights development since these concepts are not part of the Project.

HU-4b: Similarly, the DEIR should further consider that future subsurface development under certain of the new streets, whether for utilities or otherwise, may also be appropriate, and the design and construction of the project utilities should anticipate such subsurface development.

Response: See response to HU-3b.

HU-4c: It is noteworthy that the ENF does not address future nearby transit-oriented development or the need to provide for future development adjacent to or above the project, in contrast to the discussion in the South Station Expansion Project DEIR (October 2014; see page 1-3) relative to future development at South Station. That DEIR calls for an “integrated approach for transit-oriented development above and around the station expansion that relates to the urban fabric of the City as well as the waterfront.” This analytical framework is as applicable to this project as it is for the South Station Expansion Project.

Response: See Section 5.2. Conceptual planning for several major components of the project (e.g., I-90 main line, I-90 ramps, BPY rail yard) were developed with future air rights development in mind, and these provisions will be continue to be included in the project as the design is advanced. The adjacent street grid that was conceived in coordination with Harvard and other Task Force members is well positioned for transit-oriented development, should the owner elect to pursue it.

HU-4d: Thus Harvard recommends that the Secretary’s Certificate on the DEIR for the project require MassDOT to evaluate project alternatives in light of their impact on the future development of the area as a vibrant, mixed-use urban neighborhood. Harvard believes it is essential that (i) the project be evaluated not on a stand-alone basis, but rather, as an early phase in the eventual redevelopment of this area of Boston, and (ii) the project site be considered within its broader area context.

Response: The Project design responds to the criteria set in the I-90 Allston Interchange Placemaking study developed for the City, and the street grid creates a framework for a future mixed-use neighborhood. See Section 5.2. Land use within the Project Area is currently transportation-based with no access for development. The proposed street grid will provide access. The opportunity to develop the land for future uses is provided by the Project, contingent on existing environmental conditions encountered within each parcel.

HU-4e: Further, the DEIR should take into account the fact that CSX Transportation, Inc. has permanent easement rights in the project area (including the “Main Line” railroad track) which will continue after completion of its relocation from Beacon Park Yard. Those permanent easement rights will have an effect on the design and future development of the project and therefore merit careful consideration by MassDOT.

Response: CSX operating and easement rights and their effects on Project designs were considered in the design of BPY and West Station, as discussed in Section 5.2.2.2.

HU-5: Harvard supports the elimination of any suburban interchange concepts for the project and the adoption by MassDOT of Alternative 3J as the preferred project concept. However, Harvard requests that MassDOT eliminate Alternative 3J-1 from future consideration due to the considerable width of Cambridge Street shown in that option. Harvard believes that by contrast, the creation of a “South Cambridge Street” as a one- or two-way street will provide significant value to distribute traffic and reduce impacts along the edge of the adjacent residential neighborhood. Harvard believes that as described below, this new street would be useful during the project construction period as well, to help maintain traffic flow in the area.

Response: See response to EEA-18.

HU-6: Harvard acknowledges the positive role the proposed North Connector Road could play in helping to distribute traffic and reduce impacts of the project on the nearby residential neighborhood, in part by providing direct access to the I-90 ramps. Harvard looks forward to working with MassDOT on the design of this new roadway, particularly on its alignment and relationship to the proposed “Stadium Way” and “East Drive” roadways conceptually shown in Harvard’s Institutional Master Plan.

Response: MassDOT concurs and the North Connector is included in the 2025 Opening Year and 2040 Design Year traffic networks.

HU-7: Harvard recommends that MassDOT include the proposed North Connector Road in its Site Map and describe it fully in the text of the DEIR. Other highway and street matters that should be addressed in the DEIR include the following:

HU-7a: The highway facilities should be designed with appropriate horizontal and vertical clearances and pre-approved means and methods to facilitate the construction of technically feasible and economically viable air rights developments that will both spur development of a vital, new urban neighborhood and help ameliorate air and noise pollution effects of the project;

Response: See Response to comment HU-4a.

HU-7b: MassDOT should identify and plan for the location and capacity of the various utility systems to exist as a result of the project and in the future, when subsequent development will occur;

Response: See response to HU-3b.

HU-7c: The “No Access” lines for the state highway layout should be at the highway edge, and such “No Access” lines should be minimized;

Response: The proposed limits of the MassDOT “No Access Line” are south of Cambridge Street South, along the east and west sides of north-south connector roads, and along the eastbound and westbound ramps systems. No access lines are established on the basis of public safety to avoid potentially unsafe maneuvers to and from unregulated driveways. Figure 5.2-1 shows the conceptual jurisdictional boundaries.

HU-7d: The new connector streets between Cambridge Street and the state highway layout should be located, designed and graded in anticipation of new east-west streets that would be built concurrently with the future development of the area. Their design should be consistent with the local streets to be constructed north of Cambridge Street in connection with future Harvard development (e.g., “Stadium Way” and “East Drive”) within the context of the City of Boston’s Complete Street Guidelines; and

Response: See response to MAPC-1.

HU-7e: The design of Cambridge Street should be consistent with the City of Boston’s Complete Street Guidelines and coordinated with the connecting streets to be constructed as part of the project.

Response: See response to BTD/BRA-8.

HU-7f: With respect to the last two points above, Harvard believes that all of these design efforts should be consistent with the shared goal of facilitating the future development of a vibrant, mixed-use urban neighborhood both north and south of Cambridge Street.

Response: The Project responds to the criteria set in the I-90 Allston Interchange Placemaking Study developed for the City, and the street grid creates a framework for a future mixed-use neighborhood. See Section 5.2 and response to HU-4d.

HU-8: At the most recent Task Force meeting, MassDOT representatives indicated that MassDOT will examine redefining the planned functions of East Drive and Stadium Way as shown in the Option 3J designs so that Stadium Way passes over I-90 and connects to West Station and East Drive provides the connections to the westbound highway on- and off-ramps. Harvard encourages MassDOT to pursue this refinement to Option 3J, because it may strengthen access to West Station, and may also distribute traffic more optimally. This refinement may also address concerns about the elevation and grade of the “East Drive” crossing, as well as the size of the embankments that may be needed to support this crossing during the interim period before building development occurs.

Response: The proposed alternative (Alternative 3K) contains the noted refinements as discussed in Chapter 3.

HU-9: There are discussions on-going about a potential reconfiguration of Soldiers Field Road access that would complement efforts to increase park space along the Charles River and simplify the intersection of Cambridge Street with the Soldiers Field Road ramps and the highway service roads and ramps. This intersection has long been one of the Commonwealth’s most nettlesome and accident-prone. Harvard encourages MassDOT to examine the feasibility of relocating the Soldiers Field Road eastbound off-ramp at Cambridge Street to a location south of Cambridge Street which in turn, could create a new gateway to the future new neighborhood south of

Cambridge Street. That new access road could include the multi-use pedestrian/bicycle path that is widely-supported by the community, Harvard, and other stakeholders. If this option proves feasible, it may make possible the elimination of the eastbound Soldiers Field Road ramp to Cambridge Street and the creation of more park space along the edge of the Charles River.

Response: The Project will relocate the SFR westbound off-ramp from Cambridge Street to Cambridge Street South. See Chapter 3 and Section 5.4.

HU-10: The relocation of Soldiers Field Road under consideration and the introduction of a multi-use path will significantly enhance local and regional pedestrian and bicycle circulation, because the present configuration of Cambridge Street, coupled with the forbidding Cambridge Street/Soldiers Field intersection, is a significant deterrent to such pedestrian and bicyclist use. Harvard recognizes that the creation of this multi-use path and other access points in the area as well as enhancements to the Paul Dudley White Bike Path, might need to occur on Harvard-owned land, and Harvard is open to achieving mutually acceptable design outcomes. Such designs should support the emergence and/or eventual development of an urban street grid both south and north of Cambridge Street.

Response: In coordination with Harvard University, SFR will be shifted to the west, thereby creating open space to the east adjacent to the Charles River, and to be reconstructed in a proposed depressed roadway section, enabling pedestrians and bicyclists to access the space on a level alignment from the street network. See Section 5.4.

HU-11: Harvard continues to support, as does the Task Force, the construction of West Station as a new intermodal center along the Framingham-Worcester branch of the MBTA commuter rail system. The ENF describes a two-platform station with four tracks. Harvard is committed to granting the MBTA and/or MassDOT, the permanent easement rights necessary for the construction and operation on Harvard-owned land, of West Station, its associated tracks and related access roads/paths.

Response: Comment noted.

HU-12: West Station will be an important element of the "Build" alternative explored in the DEIR. It has the potential to benefit regional transportation needs by, among other things, alleviating some of the transportation burden currently borne by I-90. The DEIR should define the proposed rail and bus operations at West Station so that West Station provides the robust array of mass transit access that this part of Boston sorely needs - including the capacity to expand future service connectivity. This analysis should include an examination of bus service needs and possible decking over a portion of the rail layup/layover facility to make such bus service possible. The planned rail operations analyzed should address the opportunities described in the MBTA Five Year Capital Plan, such as the use of Diesel Multiple Unit (DMU) service at West Station to provide more frequent commuter rail access. In the DEIR, MassDOT should also describe the train signal improvements that will need to be implemented to accommodate the upgraded Framingham-Worcester rail corridor and how they will be implemented.

Response: A draft service plan was developed for the rail and transit services and was used as a basis for the build alternative and is included in Section 5.9. At this time, the Commonwealth of Massachusetts does not currently have formal plans to implement new rail technology on the MBTA's commuter rail system. However, should the Commonwealth contemplate implementing this type of technology into the system in the future, the Project would not preclude these services and would be compatible with the use of new technologies.

New signal and switching infrastructure will be constructed between CP-6 (Newton) and CP-3 (Boston) would support expanded service along the Framingham/Worcester Branch.

HU-13: The breadth and quality of access to and from West Station from the roadway network to the north will be critical to achieving its full potential as part of the regional transportation system. Harvard believes that MassDOT should create multi-modal access to West Station by making the planned access road from the north a two-way roadway open to general traffic (including bicyclists) and providing quality pedestrian and bicycle connections. Harvard also requests that MassDOT describe how pedestrian and bicycle connections to and from the North can be optimized. It is important that the DEIR clarify when West Station will become operational, the particulars of its design (particularly relating to access for buses, passenger vehicles ("kiss and ride" areas), pedestrians, and bicyclists), and the conditions and timing for its build-out.

Response: Sections 5.3.5, 5.7 and 5.9 and Appendix A, Rail Yard and West Station Alternatives Analyses, describe how connections will be accommodated to and from destinations north and south of the station. The West Stations Alternatives Analysis also addresses access for buses and accommodations for "kiss-and-ride," shuttle buses and Express Buses.

HU-14: Finally, as previously noted, West Station must be planned to optimize the potential for future air rights development that is both technically feasible and economically viable.

Response: As noted previously, MassDOT is committed to working with Harvard to provide a final design and construction alternative that supports a technically feasible and economically viable air rights development. See response to EEA-7 and Section 5.2.

HU-15: The ENF indicates MassDOT's plans to introduce into a portion of the project site south of Cambridge Street, a commuter rail layup/layover facility for daytime use that could accommodate 14-20 commuter rail consists. This would be a new rail facility and one of perhaps a series of such facilities that the MBTA has identified as necessary to meet future commuter rail service needs (as set forth in the South Station Expansion Project ENF and DEIR). The variance in the number of train consists is directly related to MassDOT's stated intent to include myriad maintenance functions in the proposed rail facility, including wheel truing, a passenger car wash facility, and an enclosed inspection pit building.

Response: Comment noted.

HU-15a: Harvard strongly opposes the proposed wheel truing and passenger car wash facilities, as the design requirements of such structures would preclude the ability to construct the deck(s) that would be necessary to support future air rights development over the rail facility. MassDOT should design and construct this rail facility in such a way as to maximize technically feasible and economically viable air rights development. The inclusion of the wheel truing and passenger car wash functions in the proposed rail facility is inconsistent with that objective. The Secretary's Certificate on the DEIR should require that all program and design elements of the rail layup/layover facility be developed so that the facility does not hinder the viability and feasibility of future air rights development over it.

Response: Maintenance facilities, including the car washing facility, are no longer proposed as part of the Project. Only light maintenance not requiring heavy equipment or facilities would occur at the rail yard, including activities such as trash removal, internal car cleaning and refueling.

HU-15b: Since the full scope of the proposed rail facility is not known at this time, Harvard cannot comment fully on this element of the project. As a result, Harvard believes that the DEIR should, as part of the "Build" scenario, set forth the complete program of maintenance and "running repair" activities which the MBTA proposes to operate at the proposed rail facility, as well as the proposed track layout and horizontal and vertical layout alignments. This program and design should be then evaluated as to its effects on future area development and on the neighboring residential community to the south. As previously noted, the preclusion of air rights development is inconsistent with this objective as well as with the goal of ameliorating to the maximum extent possible, the potential negative environmental effects of the project, including noise and air pollution. As part of the Build scenario, the DEIR should also describe fully, (1) the relationship between the proposed rail facility and the South Station Expansion Project, particularly relating to the rail layup/layover facility proposed to be constructed by the MBTA, (2) the mitigation measures (both physical and operational) that will be implemented by the MBTA to minimize air and noise pollution effects, (3) the infrastructure improvements that will be constructed by the MBTA and/or MassDOT to support the rail facility, and (4) the measures the MBTA will undertake to operate a "green" facility.

Response: Appendix A, Rail Yard and West Station Alternatives Analysis, provides different proposed layover designs and functions and their impacts to proposed future projects and developments within the Project Area.

HU-15c: MassDOT indicated in the ENF that the "No Build" alternative would include the rail yard. Harvard requests that the Secretary require MassDOT to exclude the rail yard from the No Build alternative. The project site is not currently operating as a rail yard and MassDOT does not have any current easement or other possessory rights to operate a rail facility of any kind at the project site.

Response: An agreement in principal has been reached between Harvard and MassDOT to use approximately 22 acres of BPY for a new commuter rail layover, maintenance facility and rail station. MassDOT and the MBTA will continue to coordinate with Harvard University throughout the Project.

HU-16: The ENF appropriately notes the past use of much of the project area for rail yard purposes and resultant environmental conditions. The project site does contain several Disposal Sites (as defined in the Massachusetts Contingency Plan), some of which are the responsibility of MassDOT to remediate, some of which are the responsibility of CSXT to remediate, and others of which are the shared responsibility of MassDOT and CSXT to remediate. The DEIR should contain MassDOT's plans for remediation of those Disposal Sites for which it is responsible, in whole or in part.

Response: Comprehensive plans for addressing individual disposal sites are outside the typical scope of a DEIR. Regulatory submittals, such as remedial plans conducted in accordance with 310 CMR 40.0000, will be submitted to MassDEP and publicly available via the MassDEP on-line report viewer.

Active MCP sites are referenced in Chapter 4.20, and details regarding all sites are presented in Appendix J, Hazardous Materials Assessment Report. This includes the responsible parties and compliance schedules of the active sites. The sites for which

MassDOT and CSXT share Principal Responsible Party (PRP) status have been closed. The sites for which MassDOT has sole PRP status are currently being evaluated in the context of closure strategies, which is consistent with the MCP Phased approach to Disposal Site Management. Should the MCP Phased approach yield selected mitigation alternatives in time for the DEIR submittal, additional details will be provided in the DEIR.

HU-17: In addition, the DEIR should contain a discussion of the new infrastructure that will need to be constructed as part of the project, such as a new storm water drainage system and outfall to the Charles River (replacing the current obsolete system). The project's environmental consequences should be fully accounted for, and MassDOT should assume full responsibility for the new infrastructure supporting the project. This new infrastructure should also be designed to facilitate development that will occur after the project's construction is complete.

Response: A description of proposed stormwater management features is included in Section 5.17, Figures 5.17.4 through 5.17-7 and Appendix M, Stormwater Management Technical Appendix. Also see response to HU-3b.

HU-18: The DEIR should include a fulsome description of the project's construction phasing, since the project will affect an area of Boston where traffic congestion and traffic safety are already serious problems. The size of the project site south of Cambridge Street may create the potential to mitigate many of the adverse traffic impacts during construction, particularly as they relate to the construction of the mainline highway in the interchange area. However, as with any multi-modal project of this size, there will be significant construction challenges such as the reconstruction of the viaduct structure, the reconfiguration of the connections to the local street network, and reconstruction of Cambridge Street so that it operates at grade. Other challenges will relate to coordination of this project with planned improvements to the rail network at South Station that affect the timing of construction and/or initial operation of the planned rail layup/layover facility.

Response: Broad level phasing of the Project is discussed in Section 5.22. Overall phasing includes initial construction of the highway for the opening year 2025 with upgrades to the mainline tracks and modifications to the existing yard ladder to maintain the MBTA's by right use of those tracks. This is followed by construction of the proposed yard with the potential of an expanded interim yard in the footprint of the proposed station. Staging is then concluded with the removal of any interim yard tracks and construction of additional main line tracks and the proposed station adjacent to the permanent yard for the Design Year of 2040.

HU-19: In addition to providing a complete construction staging plan and schedule in the DEIR, MassDOT should also address (1) the potential use of the proposed "North Connector Road" and "South Cambridge Street" for construction vehicles only as part of the construction management/traffic maintenance plan for the project, and (ii) when elements of the project (e.g., the proposed rail facility) will become operational and their relationship to other regional projects such as the South Station expansion.

Response: Conceptual construction staging plans are included in the DEIR. The analysis of the Throat Area Variations provides a comparative estimation for construction duration of each variation. Complete construction staging plans and schedule will be developed in the final design. The construction of the proposed street grid will require use of select street segments because not all of the grid can be constructed at once while maintaining traffic. No one segment can be designated for construction use only until sufficient street construction of the entire grid is completed which is anticipated to be towards the end of project completion.

HU-20: MassDOT should also describe mitigation measures, such as additional transit service and enhancements to the local traffic signal system that will likely be needed to mitigate the construction period traffic impacts of the project. The construction management/traffic maintenance plan will need to take into account other development and public infrastructure projects planned to proceed in the vicinity of the project.

Response: As design advances, MassDOT will develop a detailed Construction Management Plan in coordination with the City, the community and Harvard. Additional transit service and traffic signal management may be components of that plan. Detour routes are not anticipated during construction. The streets near the border of the project (Cambridge Street, SFR, Ashford Street) will be impacted by construction, but traffic will be maintained by shifting lanes and sidewalks. Additional transit service provided by the MBTA will be considered only if the need is established by observed travel mode shifts. It is anticipated that travel modes impacted the most will be bicycle and pedestrian related. Bordering traffic signal systems on Cambridge Street will be considered for timing adjustments based on observed travel behavior at the time of construction.

HU-21: The transportation study area for the project will include roadways, intersections and transportation services that are currently part of Harvard's Institutional Master Plan transportation study area. Harvard requests that MassDOT work with Harvard and the City of Boston to define the study area and protocols for maintenance and use of the transportation model so that it can be used by Harvard and others as part of future filings under MEPA and/or the City of Boston's Article 80 development review process. This transportation model will need to address potential issues related to data gathering in the study area while there are project-related construction disruptions and detours.

Response: MassDOT has shared the CTPS modeling assumptions with the Harvard University team. Land use assumptions for 2025 and 2040 for Harvard's Allston Campus and Enterprise Zone were provided by Harvard University to CTPS. See Section 5.8.2 and Appendix C, Traffic Operations Study.

HU-22: As noted previously in this letter, Harvard requests that MassDOT include robust rail and bus service options as part of the transportation analysis of West Station in the "Build" alternative. Currently, the ENF speaks only to the assessment of roadway elements in this regard. However, bus and rail service enhancements at West Station would address potential travel demand growth along the Framingham-Worcester rail corridor, where there are real constraints on existing and future highway capacity. Harvard believes that it is important that the transportation demand analysis in the DEIR capture the full benefit of West Station to accommodate existing and future transit trips by all modes.

Response: See Section 5.9.3.

HU-23: Harvard will work with MassDOT and the Central Transportation Planning Staff at the Boston Region Metropolitan Planning Organization to ensure that the transportation model for the project includes appropriate assumptions about approved projects in Harvard's Institutional Master Plan.

Response: See response to HU-21.

HU-24: Harvard has already made a significant investment in the project area: it purchased the former Massachusetts Turnpike Authority-owned land and is investing in the extinguishment of most of the existing CSXT rail easement rights there, the continued existence of which would preclude any public infrastructure improvements at Beacon Park Yard. Further, as outlined in this letter, Harvard supports a series of design alternatives for the project that would contribute to the introduction of an urban grid for a future lively, mixed use neighborhood – and many of those design components would be built on Harvard-owned land. Harvard is pleased that its investments will also help make possible the implementation of this very important multi-modal transportation project which, if well planned and implemented, can serve as a springboard for regional economic growth.

Response: Comment noted.

HU-25: Harvard's investment to date and planned for the future is aimed at supporting thoughtful, environmentally responsible development in the coming years that will improve connections in the Allston neighborhood and enhance the pedestrian and bicycle connectivity with the Charles River. We look forward working with MassDOT, public officials and agencies, the Task Force, our neighbors, and other stakeholders on the continued progress of this important project.

Response: Comment noted.

Boston University (BU) NOTE: THE BU LETTER TO MEPA WAS MISSING PAGE 6.

BU-1: The ENF presents an abbreviated summary of what is an extremely complex project with many local and regional ramifications. This design of this project in the heart of the Allston/Brighton neighborhood will affect these two communities for many generations to come. As MassDOT continues their study, Boston University respectfully requests that the Secretary require the preparation of a Draft Environmental Impact Report (DEIR) that provides further explanation and analysis of the specific issues raised below:

BU-2: One of the main components of the project is the replacement of the failing viaduct and realignment of the I-90 highway to the south of its current configuration. This, coupled with the proposed All Electronic Tolling (AET), could have significant impacts on the quality of the surrounding environment. The expansion of AET to this segment of I-90 is addressed in this ENF, but is expected to be implemented prior to this project and is included in the "No Build" scenario. Bearing in mind the large population of students and other residents that live in the project area, as well as the potential for future development of the area, please respond to the following:

BU-2a: Please describe how the new highway alignment and new elevation will affect Boston University and properties in the surrounding neighborhoods of Allston and Brookline in terms of visual, noise and air quality impacts.

Response: Views of the river vary primarily in the Throat Area, where the 3K-HV Variation is up to approximately 35 feet above grade (blocking some lower level views), and the 3K- ABC scheme is at grade (lower views affected only by traffic). For views of the Project Area from Malvern Street and Babcock Street, see Section 5.3. For views of the Throat Area, see Section 5.4. See Response to FAQ Noise and Vibration and Response to EEA-86 for Air Quality.

BU-2b: Please specifically include a discussion about the impacts associated with the proposed expansion of the width of the 2,500 foot long viaduct to include shoulders and breakdown lanes. Please include a comparative analysis of a narrower width highway which would rely on a variance from the Federal Highway Administration design standards.

Response: The proposed increase in viaduct width includes 4-foot-wide left shoulders compared to the existing 2-foot-wide left shoulders, 8-foot-wide right shoulders compared to the existing 2-foot-wide right shoulders, and 12-foot-wide travel lanes compared to the existing 11 ½-foot-wide travel lanes. Although the proposed viaduct is wider than the existing viaduct, the difference is incremental versus a difference in order of magnitude. For a comparative discussion of interstate standards and non-compliant interstate design, see Chapter 3.

BU-2c: Please evaluate and provide a proposed mitigation package to address the noise, wind, air quality, and visual impacts from the new alignment, coupled with higher travel speeds associated with AET on the Boston University Campus and nearby neighborhoods of Allston and Brighton. Please be especially mindful of the high density of Allston residents and students living directly adjacent to the project and describe how noise impacts will be adequately mitigated for these residents.

Response: MassDOT conducted a noise and vibration impact analysis and evaluated potential mitigation according to MassDOT policy and procedures. The results of the noise and vibration impact assessment and the evaluation of potential mitigation for each project alternative are presented in Section 5.11 and Appendix H, Noise and Vibration Analysis. Mitigation measures are included in Chapter 7.

BPY facilities will not significantly visually impact neighboring uses as the proposed facility will be constructed in the same location as the existing BPY facility, and will be partially shielded from view by the I-90 viaduct. The yard will be slightly lower than the existing grade, which is currently 5 feet below the neighboring residential housing to the south. Additional screening will be provided through walls, fencing and vegetative screening. Visual impacts are discussed in Section 5.3.

The aesthetic of the West Station will be consistent with other MBTA stations. MBTA will continue to coordinate with representatives from BU, Harvard and the surrounding community in designing the station. MBTA will engage with a local artist or team of local artists and incorporate artistic elements into the station design.

BU-2d: Please study and provide alternatives for the location of the AET gantries as they relate to other infrastructure projects (e.g. replacement of Carlton Street bridge) and future development of adjacent parcels and air rights.

Response: The easterly AET gantry will be reconstructed in approximately the same location to accommodate the Project’s construction. The westerly AET gantry location will not be impacted by the Project and will remain in place.

BU-3: The addition of West Station to the commuter rail service offered by the Massachusetts Bay Transportation Authority (MBTA) was included in the proposed project following a display of support for the station by task force members and community stakeholders. This new transit node will provide new opportunities and challenges for the area, with potential impacts to a portion of the MBTA network of subway, commuter rail, and bus lines. There are also several projects underway in the immediate vicinity of the project that may be affected by the station location, including Phase II of the Commonwealth Avenue Improvement Project and the consolidation of Green Line stops between the Boston University Bridge and Packard’s Corner. While BU supports the development of a West Station in this context, the potential for impact to the local community in Allston and Brookline is significant and should be carefully considered when assessing the impact of West Station generally. Please consider the following local concerns when responding:

BU-3a: The ENF does not include any analysis relating to the future use of West Station. Please study the projected ridership at West Station and the origin/destination of passengers, particularly in the Allston/Brighton neighborhood.

Response: Ridership projections for West station were developed and discussed in Section 5.9 and Appendix L, Ridership Forecasting Technical Report.

BU-3b: The location of West Station is consistent among all sixteen design alternatives studied in the ENF. In the DEIR, consider alternative locations for the proposed station. Specifically, consider locations further to the north and/or to the west, which may provide better access to residential and commercial districts in Allston/Brighton.

Response: Alternative platform, (and therefore station) locations, were considered during design development. This is presented in Appendix A, Rail Yard and West Station Alternative Analysis. Platforms are desired to be located along a straight section of track (tangent) to minimize the gaps between the straight sides of the rail cars. For this reason, locating the platform on the northern portion of the site where tracks have a significant curvature, is not feasible. Locating the platform to the west was considered and found to provide less opportunity for multimodal accessibility when compared to a location with direct connection to I-90 and space for the construction of a bus loop. This location provides access to a station within ½ mile radius of a significant portion of the surrounding neighborhoods. MassDOT has not studied placement of West Station to the north. MassDOT and MBTA have only considered station locations that are along the existing Framingham/Worcester branch line. Northerly alignments will degrade service offered to existing customers by slowing the trains and increasing delay times, as well as lessening the capability of BPY to serve its vital layover function. The DEIR does provide an Alternatives Analysis for the station location, which finds that placing the station towards the easterly end of BPY optimizes the yard functionality and offers the most efficient railroad service alternative. Locations farther west will increase impacts, both noise and visual, to the residents of those neighborhoods. Additionally, this will put the station closer to the Boston Landing station, which was already less than a mile away. The current location splits the distance between Boston Landing and Yawkey stations on either side. See Appendix A Rail Yard and West Station Alternatives Analysis.

BU-3c: Please study the resultant impacts the new station will have on ridership on the MBTA Green Line B Branch through transfers and diversions.

Response: Potential impacts to vehicle crowding on Green Line B Branch trains resulting from the proposed West Station are summarized in Section 5.9.3.

BU-3d: There is presently an effort underway to consolidate and relocate several MBTA Green Line B Branch stops in the area of the project (West Campus, St. Paul Street, Pleasant Street, and Babcock Street). Please study the effect West Station will have on this plan, taking into consideration the siting and design of the relocated stops, sidewalks, and medians and their ability to handle increased pedestrian traffic to and from West Station.

Response: MassDOT is aware of the Green Line consolidation project. The West Station location will be complimentary with both the Commonwealth Avenue MBTA bus service stops (Route 57) and the Green Line consolidated stops at Babcock Street and Packards Corner. MassDOT has proposed West Station access points from Malvern Street, due north of Packards Corner, and at both Babcock Street and Agganis Way, which are due north of the Route 57 and Green Line stop at Babcock and Pleasant Street.

BU-3e: Please define the potential transit-oriented development growth impacts associated with West Station and the new development parcels created by the new I-90 alignment, and describe the secondary traffic impacts of this development.

Response: Transit-oriented development will be created by private owners, particularly Harvard University, but also potentially by other private and institutional property owners in the vicinity of the station. MassDOT has been working with Harvard University and the City of Boston to evaluate the major defining elements of the future street and so that the roadway network supports the interchange function. Ultimately it will be the City and Harvard that will drive the transit-oriented growth of the district.

CTPS modeling for the project (highway and transit) accounts for the redevelopment potential of the BPY, therefore, the traffic analysis results documented in the DEIR account for this impact. See Section 5.8.2 and Appendix C, Traffic Operations Study.

BU-4: The layover facilities proposed at the Beacon Park Yard (BPY) site are included in this project as a response to studies undertaken by MassDOT for the South Station Expansion (SSX) Project. That study identified the current deficit of layover capacity affecting the operations of the MBTA fleet, specifically during the daytime, off-peak hours. Presently, facilities at BPY, Widett Circle, and Readville Yard 2 are proposed to satisfy the current and future layover needs of the MBTA, with BPY identified in the DEIR for the SSX Project as the “preferred location.” However, the I-90 Interchange Project also proposes a variety of additional uses at the BPY site including wheel truing, car wash, maintenance facilities, and a pit track. A layover and maintenance facility of this magnitude indicates heavy industrial uses adjacent to one of the main residential areas of the Boston University campus and portions of the residential neighborhood in Allston. While layover tracks alone may not pose significant impacts to surrounding areas provided no idling takes place, many of the other maintenance operations planned for BPY may result in significant noise, odor, and visual impacts to abutters. Boston University remains concerned about the compatibility of the proposed uses with the surrounding neighborhood and requests a response to the following:

BU-4a: Please describe how the need for each of these uses was determined, what alternative locations were considered and whether or not all of these functions must be located at one site.

Response: An assessment of the potential BPY layover and maintenance facility functions and activities was developed. Additionally, an alternatives analysis of the various concepts for layout and maintenance was developed and is included in Chapter 3. The need for layover tracks on the MBTA’s South Side commuter rail operations and the operational advantages of locating a layover in close proximity to South Station were identified in the DEIR for the South Station Expansion Project. Maintenance facilities, including the car washing facility, are no longer proposed as part of the Project. Only light maintenance not requiring heavy equipment or facilities would occur at the rail yard, including activities such as trash removal, internal car cleaning, and refueling.

BU-4b: Please indicate the number of train sets that will be stored at BPY, what maintenance services will be performed, and what the hours of operation at the site will be. Please also indicate if train sets stored at BPY will remain idling during the layover, particularly in cold weather months.

Response: Chapter 3 includes a description of the proposed yard and maintenance operations.

BPY is being designed to accommodate a minimum of 8 train sets. A ‘trainset’ includes a locomotive and 9 passenger coaches Locomotives may idle in place during shorter-term layover and during colder seasons. Idle times are limited to 30 minutes by the Clean Air Act Settlement consent agreement between MBTA and EPA. MassDOT plans provide for the inclusion of "plug-ins" at each locomotive layover location. These plug-ins are designed to supply the locomotive with electric power for lights, ventilation and temperature control, limiting the need for idling.

MBTA will utilize the layover and maintenance facilities during the midday period to perform federally mandated inspections and running repairs, cleaning, fueling (by truck), and other light duty repairs. The midday period extends between the morning and evening rush hour periods when there is less revenue service on the main line tracks. All heavy maintenance activities will continue to be completed at the Boston Engine Terminal in Somerville or at an off-rail facility. Previously, a car wash, pit track building, and wheel truing facility were included as a part of this project. In coordination with the landowner and other involved parties, it was deemed that these will no longer be included.

BU-4c: Please describe a mitigation strategy that will adequately address the combined impacts of these operations.

Response: MassDOT conducted a noise and vibration impact analysis and evaluated potential mitigation according to MassDOT policy and procedures. The results of the noise and vibration impact assessment and the evaluation of potential mitigation are presented in Section 5.11 and 7.11, respectively, and Appendix H, Noise and Vibration Analysis. MassDOT is committed to implementation of a noise barrier wall to be placed along the southern property line to benefit residences along Pratt Street, Wadsworth Street and Sawyer Terrace.

BU-4d: The location of the layover tracks and maintenance facilities is consistent among all sixteen design alternatives studied. In the Draft Environmental Impact Report (DEIR), please consider alternative locations for the proposed layover tracks and maintenance facilities which would result in reduced environmental impacts on the surrounding neighborhood.

Response: As part of the South Station Expansion project, MassDOT determined that a layover facility to the west of South Station is needed and therefore selected BPY as a portion of its Preferred Alternative. Since that time, MassDOT has considered alternative layouts for the design of the layover yard and its proposed facilities in relation to the proposed West Station, which are provided in Section 3.

Several layover track layouts were considered within BPY. There is estimated to be little difference in "environmental impacts" among the alternatives.

BU-5: The possibility of DMU and/or BRT service in the future along the existing Grand Junction right of way has long been the topic of discussion as a strategy for improving regional connections. In addition, BRT routing between Allston/Brighton and the Longwood area has been the subject of much planning effort by the University and others. A thorough, long-term planning process for this project cannot neglect the implications this project will have on these future opportunities. In crafting a vision for future connections to and through the area, please respond to the following:

BU-5a: Please study how the proposed project will preserve or inhibit future options for utilization of the Grand Junction right of way for DMU and BRT service.

Response: The Project is designed in a manner so as to not preclude future use of the GJR ROW for passenger rail service. West Station is being designed to include two platforms and four tracks, and signal systems are being designed to accommodate future revenue service on all tracks, including connections to the GJR. Planning for future BRT service on the GJR ROW is outside the scope of this Project.

BU-5b: Consider ways to incorporate DMU and BRT service into the overall strategy for West Station.

Response: Chapter 5 describes future Project assumptions and the impacts, if any, the construction and operations of West Station and the BPY layover facility will have on existing freight and commuter services and future services and connections. The implementation of either Urban Rail (DMU) or BRT services is outside the scope of this Project. The design concepts developed for West Station incorporate tracks and a station platform in consideration of a future urban rail system. In addition, MassDOT has developed concepts that will support future transitway, such as BRT into West Station. See Appendix A, Rail Yard and West Station Alternatives Analysis.

BU-5c: Please describe how the project will accommodate the need for BRT access between Longwood Medical Center and Allston/Brighton by utilizing a future "Y" connector at the BU Bridge for BRT access.

Response: Planning for future BRT service connections are outside the scope of this Project. However, the Project will not preclude implementation of BRT service in the future. If there is a need in the future to make a BRT connection between Longwood Medical and Academic Area (LMA) and Allston it could not be achieved via the "Y" connection due to the proposed relocation of the Soldiers Field Road alignment. Improved access from the project area to these potential BRT terminal points at BU are provided for pedestrian and bicyclists through West Station to Malvern Street and Babcock Street.

BU-5d: Please define proposed routing of BRTs connecting West Station to other locations.

Response: Routing to/from the north will be via Seattle Street Connector or Cattle Drive Connector. From the south, routing will be via Commonwealth Avenue and Malvern Street. See Section 5.9. Dedicated bus lanes that are typically required for a BRT system do not exist on the street network surrounding the project. At some future time if BRT routes are established to the edges of the proposed street grid, some portion of the streets could conceivably be re-purposed from travel lane to dedicated bus lane. See response to BU-5c.

BU-5e: Please consider a variety of routing alternatives for BRT service from Allston/Brighton to the Longwood Medical Center, including the use of Soldiers Field Road/Storrow Drive between West Station and Charlesgate.

Response: SFR is vehicle height restricted and buses are not allowed; Storrow Drive is likewise restricted. A potential bus/BRT route between West Station and the LMA via I-90 was evaluated, and is discussed in Appendix C, Traffic Operations Study.

BU-6: Traffic impacts in the area of the project are of great concern to Boston University. The safety of pedestrians, cyclists, and motorists at the campus is heavily dependent on the traffic conditions on and around Commonwealth Avenue. The University, along with its public partners, have invested millions of dollars in safety improvements to the Commonwealth Avenue corridor. Increased traffic in the area as a result of the project has the potential to affect the nearly 100,000 people that travel through the area daily. Please respond to the following concerns relating to the potential traffic impacts associated with the project: The Traffic Impact Assessment should include the future build-out of all development parcels created as a result of the project in order to adequately study the future traffic impacts from the project.

Response: CTPS modeling for the project (highway and transit) accounts for the redevelopment potential of the BPY, therefore, the traffic analysis results documented Section 5.8.2 and Appendix C, Traffic Operations Study account for this impact.

BU-7: MassDOT has demonstrated its commitment to creating exceptional public spaces in connection with infrastructure improvements for active modes of transportation throughout the project area. Boston University shares this commitment to improving access to vital urban public open space areas. Please describe how the project will be consistent with this goal by addressing the following:

BU-7a: Describe how the project will broaden the existing network of pedestrians and bicycle routes to overcome existing barriers to access to the Charles River created by transportation infrastructure.

Response: See Section 5.7.

BU-7b: Please identify measures that demonstrate how the project will contribute to the creation of enhanced green spaces along the Charles River and how access to those areas will improve from all directions, including from the Boston University Campus.

Response: The Project expands parklands along the Charles River. It greatly improves accessibility to that parkland through the creation of an at-grade pedestrian/bicycle crossing from the sidewalk and cycle track on the north side of Cambridge Street South, with connections from Malvern Street and Babcock Street. See Sections 5.4, 5.7 and Section 5.9 and response to Open Space FAQ 1 and 2 in Section 9.1.1.

BU-8: The Allston 1-90 Interchange project presents an opportunity to redefine this portion of the city like no other project of our time. With clear direction, thorough study, and commitment to bettering the environment for all users, the project has the potential to enhance the economic, environmental, and social quality of the neighborhood. While BU supports the relocation of the 1-90 interchange and the development of a West Station in this context, the potential for impact to the local community in Allston and Brookline is significant. Boston University appreciates your consideration of these important issues and stresses the importance of requiring MassDOT to undertake an in-depth investigation of the issues raised above. Boston University applauds the progress that has been made to date and looks forward to this project as it seeks to transform the Allston/Brighton neighborhood.

Response: MassDOT recognizes Boston University's importance as a Task Force member, direct abutter to the project area, and as a future user of the proposed West Station and reconfigured interchange. MassDOT values the University's perspective and looks forward to continued cooperation with Boston University on this important project.

Northeastern University School of Architecture NU (Arch)

NU (Arch.)-1: Include green stormwater infrastructure that anticipates a future central open space as an integrated component of the MassDOT contract. As a result, scope a comprehensive storm water planning initiative that implements best practices green approaches. The storm water solution should be integrated into an open space network that functions as a visual, recreational, and cultural amenity for future development and the surrounding neighborhoods.

Response: Design of future open space (and possibility for integrated green infrastructure) will be addressed as plans are developed by the property owner. The Project will upgrade the existing stormwater management system that offers little to no provisions for water quality treatment to a modern stormwater system that utilizes L.I.D and incorporates stormwater BMPs. Open Space within BPY is limited due to the parcel size and the demand and need requirements for a rail yard. Within BPY, the Project has limited the amount of impervious area, and introduced porous pavement in the remaining areas. The stormwater management design of BPY will include several areas for surface BMPs where open space is available.

NU (Arch.)-2: Move the West Station access streets further west to reduce the height of the bridges and berms, making them more pedestrian and bicycle-friendly. With West Station now part of the project, scope a comprehensive study that explores alternative locations, configurations, and cross-sections for the streets that connect Cambridge Street and the future development parcels to West Station.

Response: MassDOT considered several alternative positions for West Station within the Project Area. Refer to Appendix A, Rail Yard and West Station Alternatives Analysis, for additional information and Chapter 3.

NU (Arch.)-3: Align the southern terminus of the West Station access streets with Malvern and Alcorn Streets to allow for future direct vehicular, pedestrian, and bicycle access. Scope a study that explores the full range of potential options for connecting West Station to the Boston University campus, Commonwealth Avenue, and the neighborhoods to the south. This study should explore should opportunities outside of the project boundaries in order to establish the proper alignments for future projects that can add to and complete connections that are enabled by the MassDOT project.

Response: MassDOT is positioning West Station in a manner that provides for convenient access from the south. Multiple shared use path alternatives provide pedestrian and bicycle accommodations to and from the south side of West Station. This includes connections from Malvern Street and Babcock Street, which are logical connection points as they each are continuations of the existing streets. See Sections 5.3, 5.4 and 5.7.

Northeastern University Beacon Yards DeNovo Urbanism Studio NU (BYDUS)

NU (BYDUS)-1: Include green stormwater infrastructure that anticipates a future central open space as an integrated component of the MassDOT contract. As a result, scope a comprehensive stormwater planning initiative that implements best practices and green approaches. The stormwater solution should be integrated into an open space network that functions as a visual, recreational, and cultural amenity for future development and the surrounding neighborhoods.

Response: See response to NU Arch-1.

NU (BYDUS)-2: Move the West Station access streets further west to reduce the height of the bridges and berms, making them more pedestrian and bicycle-friendly. With West Station now part of the project, scope a comprehensive study that explores alternative locations, configurations, and cross-sections for the streets that connect Cambridge Street and the future development parcels to West Station. In addition, consider connections across Cambridge Street to Lower Allston and future connections to the Harvard University campus.

Response: See response to NU Arch-2.

NU (BYDUS)-3: Align the southern terminus of the West Station access streets with Malvern and Alcorn Streets to allow for future direct vehicular, pedestrian, and bicycle access. Scope a study that explores the full range of potential options for connecting West Station to the Boston University campus, Commonwealth Avenue, and the neighborhoods to the south. This study should explore opportunities outside of the project boundaries in order to establish the proper alignments for projects that might occur in the future that can add to and complete connections that are enabled by the MassDOT project.

Response: See response to NU Arch-3.

Charles River Watershed Association (CRWA)

CRWA-1: The ENF does not include any mapping or documentation of the existing stormwater infrastructure on site. It is therefore impossible to determine how the proposed alignments impact or interface with the infrastructure currently on site.

Response: Section 4.17 describes the existing stormwater infrastructure and Figures 4.17-1 and 4.17-2 illustrate the existing system and watersheds, respectively. Section 5.17 describes the proposed system. Figures 5.17-1 through 5.17-4 illustrate the proposed stormwater management systems for each Throat Area Variation. Figures 5.17-5 through 5.17-7 illustrate the existing system with an overlay of each Throat Area Variation. All existing drainage infrastructure within the interchange will be abandoned or removed with the following exceptions: Salt Creek Culvert (BWSC), Pump Station 2 including pipe connections and outfall to the Charles River (MassDOT), I-90 drainage system west of the Cambridge Street bridge (MassDOT), and most of the 12” to 24” culvert outfalls at the Charles River bank (DCR).

CRWA-2: Given the fact that this area was historically a tidal marshland that was filled over time, the DEIR should document how the site was engineered and paved over to make way for the current I-90 alignment.

Response: Historic land uses are described in Section 4.2 and Waterways Section 4.12 describes the history of fill within the Project Area. The tidal marshland was filled in the 1800’s in conjunction with train storage, maintenance, and switching yard that covered the entire site. I-90, constructed in 1960, involved removal of nearly all of the yard north of I-90 and south of Cambridge Street. The construction of I-90 took place on land that was previously filled and developed for rail operations. A list of Chapter 91 historic licenses and a plan showing the location of licenses is included in Appendix I.

CRWA-3: The site was also traversed by a tidal estuary and stream corridor (Salt Creek) that flowed into the southern section of site and discharged into the Charles River. It is assumed that this creek still flows in an underground culvert through the site and discharges flows from a larger sub-watershed that extends further south beyond the current site boundary. Historic site hydrology should be discussed in detail in the DEIR since this could provide opportunities for stormwater management and environmental restoration.

Response: Salt Creek flows under the BPY property from south to north in an easterly direction toward the Charles River. The creek is contained in a 7 foot by 7.5 foot stone culvert constructed in 1909; the culvert is approximately 10 feet below the rail yard. Neither the culvert nor the flows are proposed to be altered as part of this Project. All alternatives avoid impact to the structure. Historic site hydrology is detailed in Section 4.17.

CRWA-4: While the ENF states that the Charles River is listed as an Impaired Water and Total Maximum Daily Loads (TMDLs) have been developed (ENF Pg. 9-29 (Attachment 9), there is no discussion of how the project will comply with the Charles River pathogen and nutrient TMDLs. While the proponent states that this redevelopment project will comply with the MA Stormwater Standards to the maximum extent practicable, we note that even full compliance with the state Stormwater Standards does not insure that the project will meet the Total Maximum Daily Load for Nutrients in the Lower Charles River Basin, Massachusetts (2007). Pursuant to the Nutrient TMDL, the waste load allocation requires a 62% phosphorus reduction. The proponent should discuss in the DEIR how the project will meet the Nutrient and Pathogen TMDLs.

Response: Section 5.17 and Appendix M, Stormwater Management Technical Appendix, include an outline of the proposed stormwater management system and related BMPs providing phosphorus and nutrient removal efficiencies. The proposed BMPs and reduction in impervious area will also reduce the annual loads of bacteria and pathogens to the lower Charles River. In addition to meeting the Stormwater Management Standards to the extent practicable, MassDOT will coordinate further with BWSC during design to determine the feasibility of various BMP installations for further reductions of pollutant loadings.

CRWA-5: The DEIR should identify all outfalls from which site runoff currently discharges and the results of any outfall water quality monitoring. Identification of both existing and future drainage catchments and drainage calculations should be included in the DEIR.

Response: Section 4.17 describes the existing stormwater infrastructure and Figures 4.17-1 and 4.17-2 illustrate the existing system and watersheds, respectively. Section 5.17 describes the proposed system. Figures 5.17-1 through 5.17-4 illustrate the proposed stormwater management systems for each Throat Area Variation. Figures 5.17-5 through 5.17-7 illustrate the existing system with an overlay of each Throat Area Variation. In addition, the Stormwater Management Technical Appendix in Appendix M, includes a description of the current and future drainage catchments and calculations. Section 5.17 discusses the Project’s compliance with the MA DEP Stormwater Management Standards. Several entities own and maintain stormwater discharge pipes into the Charles River in the Project vicinity, including DCR, MassDOT and BWSC. The only entity required to monitor stormwater quality is the BWSC through the implementation of a Consent Decree issued to the Commission in 2012. The Decree was part of
a settlement agreement enforcing the State and Federal Clean Water Acts and requires the Commission to conduct frequent and enhanced monitoring (in both dry and wet weather) of its stormwater outfalls, for illicit discharges for bacteria, ammonia and chlorine. The results of such monitoring are published annually by the BWSC.

CRWA-6: The DEIR should include mapping of any soil contamination in project area that might impact the potential for groundwater recharge.

Response: The disposal sites within the Project boundaries are mapped and provided in Section 4.20 and Figure 4.20-1. Any proposed infiltration areas will be evaluated to ensure infiltration of storm water is unlikely to exacerbate existing contamination in accordance with 310 CMR 40.0191 of the MCP, which is further detailed in Section 5.20. Figure 3 of the Hazardous Materials Assessment Report in Appendix J, and details of select significant disposal sites are discussed in the text of that report.

CRWA-7: The DEIR should explore the opportunity to treat the stormwater from the entire project area via a regional stormwater wetland that would not only provide a cost effective way of complying with the TMDL, but also serve as an ecological resource and public amenity.

Response: As discussed in Sections 4.17 and 5.17, there are a number of MS4 operators, including BWSC, DCR, and MassDOT each having specific requirements and preferences for the implementation and maintenance of BMPs. Discussions with the system owners/operators regarding long term maintenance considerations as well as available right of way was the basis for the conceptual design of the BMPs within each jurisdiction as described in Section 5.17.

BMPs have been strategically placed within the Project Area in order to balance land owner interests, BMP owner maintenance considerations and feasibility for recharge with the goal of meeting water quality standards on a watershed wide basis. Figures 5.17.4 through 5.17-7 illustrate potential BMP locations for the Preferred Alternative and three Throat Area Variations.

CRWA-8: The proponent should explain the "potential modifications" and "improvements to the existing stormwater outfalls in the Charles River" that will be made (ENF at 20, 23).

Response: Potential modifications include removal of multiple storm water discharge pipes by combining them into fewer outfall locations where feasible. Improvements refer to repairs of large existing storm water discharge pipes to remain that are box culverts with headwalls in deteriorated condition. As discussed in Section 5.17, six outfalls will be removed, three outfalls will be replaced and one new outfall is proposed. Figures 5.12-1 through 5.12-3 show the discharge pipes. The discharge pipes are designed for the Preferred Alternative and would be the same design for all three Throat Area Variations.

CRWA-9: The maintenance and layover facilities proposed for the site will require enhanced stormwater controls and a robust stormwater pollution prevention plan.

Response: For construction term stormwater management, a Stormwater Pollution Prevention Plan (SWPPP) will be developed in conjunction with obtaining coverage under the EPA NPDES Construction General Permit. A description of the proposed stormwater management system at the rail yard is included in Section 5.17 (MBTA Jurisdiction) and Appendix M, Stormwater Management Technical Appendix. For operation term stormwater for rail operations, the pollution prevention plan will be developed as required under the EPA's Multi-Sector General Permit for Industrial Discharges.

CRWA-10: As voiced by a number of Task Force members and in comment letters, this project offers an opportunity to rethink and to plan for the restoration of parkland along the Charles River. Given that the entire I-90 viaduct is going to be rebuilt and the proposed scheme includes the moving of Soldiers Field Road, the DEIR should evaluate and discuss the realignment of Soldiers Field Road further under the viaduct, and as far away from the river as possible. Creating new parkland would be a tremendous public and environmental benefit, and help to mitigate the environmental impacts of this project.

Response: Under all three Throat Area Variations, there will be a significant opportunity to create open space with the expansion of the parklands along the Charles River, and improved access from the surrounding neighborhoods along the north side of Cambridge Street South. At its widest point, the parkland will expand from 14 feet to 155 feet in width. In addition, the expanded parkland will allow for new separated bicycle and pedestrian paths along the river. Open space opportunities associated with each Throat Area Variation are discussed in Section 5.4.

CRWA-11: The proponent should explain in detail its assertion that moving more of Soldiers Field Road under I-90 is not feasible. The viaduct itself should not be widened. It should also evaluate alternatives that would create more open space. While MassDOT states that it will continue to seek input on urban design issues from key stakeholders including the Boston Redevelopment Authority and Boston Society of Architects during the DEIR process, ENF at 10, the proponent in the ENF does not discuss the open space recommendations provided by the two schemes presented as part of the BSA workshops. See, http://www.architects.org/programsandevents/urbandesignworkshops. MassDOT should thoroughly evaluate both the Krieger/Mountjoy and Varanasi teams' proposals in the DEIR.

Response: MassDOT considered all proposals offered to increase open space, including those by BPDA and the ideas presented in the design charrette that they sponsored. The width of the proposed replacement I-90 viaduct is necessary in order to bring this section of I-90 up to current interstate highway design standards. Appendix B Evaluation of Soldiers Field Road Relocation Under Viaduct Concept provides additional information.

Regarding the BSA charrette proposals referenced in the comment, MassDOT is not the property owner and as a state transportation agency has no authority over local land use planning. In lieu of an evaluation of specific conceptual proposals for future development, MassDOT has consulted closely with Harvard University and the Boston Redevelopment Authority to plan a project which will allow the maximum flexibility for future development in the Project area.

CRWA-12: In addition to creating more substantial public parkland adjacent to the river, the DEIR should also discuss an open space connection from the residential neighborhoods south and west of the site to the Charles River. This "Greenway" connection would not only provide public access to the riverfront and pedestrian bridge, it could also serve as a wet weather corridor, providing stormwater management and greater resiliency for intense storm events in a changing climate. The bicycle and pedestrian alternative connections put forth in the ENF should be expanded and CRWA would be happy to meet with MassDOT and others to discuss other alternatives that would enhance the user experience and draw people to the river.

Response: Refer to Open Space and Bicycle and Pedestrian FAQ 1 and 2. The Project scope does not include investigation to create open spaces in areas south and west of the Project. Within the Project area the opportunity to establish additional open space beyond what is proposed in the DEIR is dependent on Harvard University.

CRWA-13: While the ENF mentions that Cambridge Street will be designed in accordance with the City of Boston Complete Streets guidelines, the description of the improvements makes not reference to the "Greenspace" component of the Complete Street Design. The DEIR should include specific details regarding the stormwater management BMPs that will be integrated as part of the Cambridge Street redesign.

Response: Section 5.17 describes the stormwater management BMPs for Cambridge Street and Cambridge Street South.

CRWA-14: While a Chapter 91 License is required for the project, ENF at 5, the ENF does not provide much detail on the impacts to c. 91 jurisdictional and wetland resource areas. The DEIR should include a comprehensive discussion on the impacts, public benefits, and mitigation measures proposed. Figure 6 included in Attachment 4 shows c.91 jurisdictional lands and the historic high water line. However, there is no discussion of the design implications of the above in the ENF.

Response: Section 4.12 describes the existing jurisdictional wetland and waterways jurisdiction in the Project Area and Figures 4.12-1 and 4.12-2 illustrate these areas. Section 5.12 describes the Project's impacts to jurisdictional wetlands and tidelands in the Project Area and Figures 5.12-1 through 5.12-7 illustrate the Project wetland and waterways impacts. Tables 5.12-1 and 5.12-2 quantify impacts to wetlands and waterways for each Throat Area Variation.

CRWA-15: The ENF proposes a new footbridge for cyclists and pedestrians to cross over Soldiers Field Road to the Riverfront. The appropriate location of this footbridge should be studied in conjunction with the relocation of Soldiers Field Road between the I-90 viaduct and the River Street Bridge, in order to identify the best path to the Charles and its parklands.

Response: MassDOT concurs with this comment. The proposed location of the SFR pedestrian and bicycle bridge ties in to the proposed pedestrian and bicycle improvements and the proposed additional greenspace along the Charles River ("Allston Esplanade"). See Section 5.7 for a detailed description and illustrations showing the proposed pedestrian connections.

CRWA-16: Given that the project is a non-water dependent use and located on areas of filled and land locked tidelands, it will be subject to Public Benefit Review and Determination. The DEIR should discuss this in relation to c. 91 licensing.

Response: Chapter 8 includes a Public Benefit Determination.

CRWA-17: A larger scale detailed map(s) showing the areas of c. 91 jurisdiction within the project area should be included in the DEIR.

Response: Figures 5.12-4 through 5.12-7 show Chapter 91 jurisdiction relative to the Preferred Alternative and Throat Area Variations.

CRWA-18: Lastly, the complexity of this project and community impacts requires close coordination and input from the community. Based on comments at the Task Force meetings we attended, there is much interest in continuing Task Force participation. We do not know if MassDOT is considering a special review procedure with a citizens advisory committee but we think a CAC with broad representation is important – one that meets regularly, is provided with resources and monies to hire consultants, and that is able to review and comment on documents in advance of filing. An effective model was the Muddy River Restoration Project CAC.

Response: See response to CCD-13.

Cambridge Bicycle Committee (CBC)

CBC-1: First, we emphasize the importance of maximizing connectivity for cyclists between the project and surrounding streets, particularly Cambridge Street. Cambridge Street connects this project to the Cambridge neighborhoods of Riverside and Cambridgeport, and from there to the Harvard and Central Square areas. Given the high volume of traffic, we believe that protected bike facilities – probably cycle tracks on Cambridge Street and bike lanes buffered from any parking on other key streets – will be critical to making this connectivity real for cyclists young and old.

Response: Separated bike lanes are proposed in the Project. See Sections 3.1 and 5.7.

CBC-2: Second, we ask that attention be paid to access for cyclists and pedestrians to the proposed West Station. We understand that West Station is still somewhat theoretical, but this design phase is the moment at which future connectivity can be envisioned, or foreclosed. We cannot see the value in a railroad station that is cut off from those who would use it! We ask that MassDOT create the infrastructure now such that access to West Station can be built at reasonable cost and with an inviting design to encourage the use of mass transit.

Response: Various shared use path connections are being provided from the north and south to connect BU and Cambridge Street to the Station as well as to the PDW Path and points beyond. MassDOT is positioning West Station in a manner that provides for convenient access from the south. Multiple shared use path alternatives provide pedestrian and bicycle accommodations to and from the south side of West Station. This includes connections from Malvern Street and Babcock Street, which are the logical connection points as they each are continuations of the existing streets. Refer to Appendix A, Rail and Yard and West Station Alternatives Analysis, and Sections 5.3.5 and 5.7.

CBC-3: Third, we welcome the descriptions of bicycle/pedestrian facilities and multi-modal improvements repeated throughout the ENF, and we encourage the project designers to move beyond good descriptions to good technical and design details. These details should translate to facilities that are safe and appealing for users of all ages and all confidence levels. We ask that roadways be designed to feel like welcoming neighborhood streets and not like highway on-ramps where cyclists are trespassers. Smaller block sizes help create that feel.

Response: See Sections 5.3.5 and 5.7.

CBC-4: Lastly, we ask that MassDOT move forward with cycling facilities on the River and Western Bridges that would connect the Allston section of Boston with Cambridge and the Charles River system of pathways. Crossing Cambridge Street by the river on foot or on a bike is at present an alarming and unsafe endeavor, and the near simultaneous upgrades to I-90 and the bridges creates an opportunity to make substantial improvements to safety and accessibility.

Response: MassDOT has an interim improvement project that will enhance pedestrian/bicycle accessibility at the intersections of the SFR Frontage Road with Western Avenue and Cambridge Street/River Street, including providing curb cuts and crosswalks at River Street. Reconstruction of the River Street and Western Avenue bridges is on hold pending funding. See Section 5.7.

Charles River Conservancy, Environmental League of Massachusetts, Friends of the Grand Junction Path, Watertown Bicycle/Pedestrian Committee, and Clean Water Action (CRC)

CRC-1: The proponent should be required to study the realignment of Soldiers Field Road as far south as possible, away from the river, both along the section of roadway that borders the I-90 viaduct and along the section that extends westward from the viaduct to the River Street Bridge. A 35 mph design speed for this re-built roadway should be used for this study.

Such a realignment would allow for the creation of a wider and more attractive pedestrian and cycling greenway, and also a waterfront park known in planning proposals as the Allston Esplanade. This proposal represents perhaps the most exciting possibility we will see in this century to improve the Charles River Parklands, to provide connection to the river for all the eventual users of this new district, and beauty to the many commuters who will pass through it. The additional parklands, facing the river and looking across it to Magazine Beach in Cambridge, will create a natural setting as beautiful in its way as Boston Common, and like it a vital center for cultural and leisure activities that will bring vitality and character to this new urban hub.

Response: See response to Open Space FAQ 1 and 2. The proposed re-alignment of SFR was studied from the GJR Bridge to River Street. To preserve the current attributes of the parkway in a re-located position the existing maximum curvature is preserved. See Sections 3.1, 5.4 and 5.7.

CRC-2: The proponent has proposed constructing a new footbridge for cyclists and pedestrians to cross over Soldiers Field Road to the Allston Esplanade. The appropriate location of this footbridge should be studied in conjunction with the relocation of Soldiers Field Road between the I-90 viaduct and the River Street Bridge, in order to identify the most direct path to the Allston Esplanade.

Response: See response to EEA-35. Also see Sections 3.1 and 5.7.

CRC-3: The proponent should be required to study ways to widen the Grand Junction rail bridge below the BU bridge to accommodate two tracks and a pedestrian/cycle path, so that this essential connector, which has the potential to join West Station and the People's Pike pedestrian/bicycle path to East Cambridge, Kendall Square, and beyond, is fully in place in advance of the main I-90 construction, and available to meet the full requirements of future transit and carbon-free transportation modes.

Response: Modifying the GJR Bridge over the Charles River is beyond the scope of the Project.

CRC-4: Many advocates and Allston residents have supported a "People's Pike" path parallel to the newly aligned I-90 with multiple treadways to serve both pedestrians and cyclists. The Boston Society of Architects team organized by NBBJ Architects has proposed that this path or linear park should have dimensions and style similar to the Commonwealth Avenue Mall in Boston's Back Bay, and should connect directly to the Allston Esplanade. The proponent should be required to study the feasibility and desirability of this proposal and consider how it can promote pedestrian and cycling travel as well as best practices for storm-water management.

Response: See response to EEA-35.

CRC-5: The re-alignment of Soldiers Field Road westward from the I-90 viaduct to the River Street Bridge, along with the proponent's proposed new Soldiers Field Road on-ramp south of the DoubleTree Hotel, creates opportunities to reduce the Soldiers Field Road off-ramp at the River Street Bridge from two lanes to one. This lane reduction would allow widening the narrowest portion of the Dr. Paul Dudley White bike path, which occurs just downstream from the River Street Bridge, and would greatly encourage use of the path both for recreation and carbon-free commuting. The proponent should be required to study this proposal.

Response: See Section 5.7.2.6 and Graphics 5.7.10 through 5.7-13.

CRC-6: The proponent has proposed locating the Houghton Chemical rail-line along the immediate western edge of Soldiers Field Road in its current alignment. As this would be in conflict with the relocation of Soldiers Field Road mentioned above, the proponent must study alternative locations for this Houghton Chemical rail-line.

Response: An agreement between Houghton Chemical, Harvard University and CSX will lead to a discontinuation of rail services and the associated spur track to the Houghton Chemical site by spring 2019.

CRC-7: The I-90 viaduct must not be allowed to encroach permanently on the Charles River Parklands, particularly where this is done to meet federal interstate standards that are not in place on other sections of the urban interstate highway system. The proponent must study ways to avoid this adverse impact.

Response: All three Throat Area Variations result in impacts to Charles River parkland. Section 5.4 quantifies and describes the impacts associated with each Throat Area Variations.

CRC-8: The proponent should be required to study surface vehicular connection to West Station and the Turnpike from the south, i.e., from Commonwealth Avenue, so that the project connects North and South Allston, at and through the station, not just for pedestrians and cycles but for vehicular traffic. This traffic will otherwise continue to load increasing and unacceptable traffic volumes on the surface street grid on and around Harvard Avenue, with disastrous consequences to north-south traffic flow. Also see Section 5.9.

Response: An evaluation of this connection is provided in the Section 5.8.2.4 and Appendix C, Traffic Operations Study, however, construction of it is not included as part of the proposed project. The Project will be designed so as not to preclude this connection being made in the future should others wish to pursue implementation of it.

CRC-9: The proponent should be required to study ways to lower the height of rail and I-90 throughways so that north-south connections to and through West Station are not unacceptably steep, as currently proposed.

Response: Section 5.9 provides a discussion of the elevation changes of tracks and the associated operations. In order to meet design requirements for the yard, the Project will require excavation. The elevation of the tracks are constrained by connections to GJR and the Boston Landing station, structure elevation of Commonwealth Avenue, and existing drainage structures within the station area. Appendix A, Rail Yard and West Station Alternatives Analysis, provides further detail on track elevation changes and further details on pedestrian and bicycle pathways and gradients.

CRC-10: The proponent should be required to study ways that rail and Turnpike throughways, and the rail storage and maintenance facilities proposed for the site, can be fully decked in advance of construction. This proposal is essential to ensure that good urban design and connectivity principles will be implementable as the district surrounding West Station and connecting to the river is developed.

Response: See responses to Future Development/Decking/Utilities FAQ and EEA-7, and Section 5.2.

CRC-11: The proponent should be required to study possible ways to design on- and off-ramps from the Turnpike at or near Beacon Street to serve the Longwood Medical Area in order to relieve increasing volumes of surface traffic to that employment hub. These improvements must be in place before the major construction project further disrupts traffic trying to reach the Longwood Medical Area from the Turnpike.

Response: Serving the Longwood Medical and Academic Area (LMA) with additional interstate ramps is beyond the Project limits and scope. See response to comment Traffic FAQ 4.

CRC-12: The proponent must study methods for proper removal and disposal of contaminated soil so that healthy development of the site can proceed.

Response: The methods for the removal and disposal of hazardous materials is strictly controlled by the state regulations, including handling, storage and disposal. The work will be overseen by a licensed site professional (LSP). See response to EEA-140.

CRC-13: In procedural terms, the ENF fails to provide for the ongoing oversight of the citizens' Task Force, which represents numerous neighborhood and civic groups and brings essential public concerns to bear on the project. The proponent must be required to provide for this ongoing citizens' advisory role.

Response: MassDOT has continued to facilitate public input throughout the design process by hosting Task Force meetings.

Transportation for Massachusetts (TFM)

TFM-1: Transportation for Massachusetts submits this letter in support of the 12/5/14 comments submitted by WalkBoston, MassBike, Livable Streets Alliance, and seven other community and advocacy groups. The Allston I-90 Interchange Project has the potential to bring significant benefits to the Greater Boston region, as well as the state, so long as it is designed as a truly multi-modal project that will catalyze smart growth development. We share our colleagues concerns that the current design and process be improved to ensure full integration of the new West Station, permit air rights development, and include pedestrian, bike and bus access to the transit stop and between neighborhoods. We ask that in MEPA's scope for the DEIR require study of the concerns and project elements detailed by our colleagues in the 12/5/14 letter to you.

Response: Comment noted. West Station access is discussed in response to EEA-66 and in Sections 5.3.5 and 5.7. Air right development is discussed in response to EEA-7 and in Section 5.2. Pedestrian and bicycle connections are discussed in response to Bicycle and Pedestrian FAQ 1 and Section 5.7. Transit is discussed in Section 5.8.

Medical Academic and Scientific Community Organization, Inc. (MASCO)

MASCO-1: We strongly encourage MassDOT to continue coordinating with the City of Boston on its parallel efforts to form a vision for the neighborhoods that are and will surround the interchange.

Response: MassDOT will continue to coordinate with the City of Boston.

MASCO-2: Due to the regional scale of the project, we recommend that future studies include an evaluation of the level of service and queuing at the intersections of: (1) Cambridge Street and Harvard Avenue in Boston, and (2) Memorial Drive & Cambridge Street in Cambridge. Although these intersections are outside the scope of the interchange project, their operations may have spill back impacts on the area of the interchange that need to be fully understood.

Response: The intersections of Cambridge Street/Harvard Avenue and River Street/ Memorial Drive are included in the traffic study area as described in Section 4.8.and 5.8.

MASCO-3: We support bringing interchange concepts 3J-1, 3J-2, and 3J-3 into the environmental process for additional study. Of the design concepts presented to date, these three best balance the multimodal transportation needs and the concerns raised by the task Force.

Response: In response to comments from the community, the Project Task Force and the City of Boston, the 3J Alternatives were replaced by Alternative 3K. See Section 3.1.

MASCO-4: We support moving the alignment of Soldiers Field Road away from the Charles River to provide both more open space and better accommodation of bicyclists and pedestrians along the Paul Dudley White path.

Response: Realignment of Soldiers Field Road away from the Charles River results in the creation of open space for all three Throat Area Variations. See response to FAQ Open Space 1 and 2, Section 5.4 and Section 5.7.

MASCO-5: The proposed alignment of the "People's Pike" bicycle path that follows the Turnpike alignment has the potential to result in a path that is isolated from the surrounding neighborhoods and unsafe. As part of the environmental process, MassDOT should evaluate alternative alignments for the path that are incorporated into the street network of the neighborhoods created by the interchange project and are consistent with local land use planning efforts.

Response: The Interstate I-90 alignment is shifted further to the south in comparison to the concept presented in the ENF which enables Cambridge Street South to be positioned further to the south, thus resulting in a nearly straight line connection for bicycles and pedestrians within the central portion of the street grid from the North Allston neighborhood to the PDW Path. See Sections 3.1 and 5.7. Also see response to EEA-28.

MASCO-6: The details of the other pedestrian and bicycle accommodations are vague at this point however we expect they will be refined further on in the design process.

Response: The details of the pedestrian and bicycle accommodations will be worked out during the design phase, in consultation with the City of Boston. Conceptual designs are provided in Section 5.7.

MASCO-7: We support the construction of the rail yard for storage and service of MBTA commuter rail trains within the interchange. This facility will provide benefits to the commuter rail system by reducing congestion and overcrowding at South Station.

Response: Comment noted.

MASCO-8: Constructing West Station provides a new transit option (commuter rail) to the Allston neighborhood. The station layout (4 tracks and 2 platforms) appears adequate for both near-term commuter rail service and potential DMU service in the future. All of these improvements will have a significant impact on the region's transit systems.

Response: Comment noted.

MASCO-9: At the same time, roadway access to the station does not appear to have been considered at a similarly regional scale to accommodate future potential bus services into or through the site. For example, the proposed roadway access via a one-way loop road down from Cambridge Street (and other east-west roadways depending on the final design) would require buses to navigate approximately 0.75 miles through several signalized intersections with highway-related traffic to serve the station. With a site this large it would be shortsighted to not further study bus access which would enhance the positive impacts of new rail and could include: (1) two-way operations on the West Station access roadways and/or (2) bus priority treatments (dedicated lanes, favorable signal timing, etc.) on the north-south roads accessing the station.

Response: West Station and the bus loop have been designed to accommodate current and future bus services. The roadway loop that services the station can be accessed regionally directly from the I-90 Eastbound off-ramp as well as locally from Cambridge Street to the north. Refer to Appendix A, Rail Yard and West Station Rail Alternatives Analysis, for additional information.

All alternatives provides for a two-way bus loop at West Station. Provisions for possible future bus priority treatments will be incorporated into the design of the Phase 1 roadways to the extent possible or foreseeable (West Station will be constructed as a later part of the Project). Bus access between the interstate system (a regional system) and West Station is proposed which results in an attractive attribute for multi-modal connectivity. The roadway connectors to West Station are not one-way, but two-way, and the West Station bus loop is also two-way, not one-way. Projected bus demand does not warrant dedicated lanes. If warranted and feasible, bus priority signal timing will be considered in final design.

MASCO-10: While bus service planning has yet to begin, a number of routes might be identified in the future that could better serve the immediate neighborhoods and the region by being routed into or through the station. Subsequent analysis may further identify what infrastructure would be needed at the station to support their operational characteristics (bus berths, waiting areas, circulation patterns, etc.). Any number of existing or new services may potentially be served by the station from rerouting the existing Rt. 66 to extensions of services from areas like Arlington, Sullivan and Kenmore Squares or elsewhere (parts of the former crosstown Urban Ring project). Since the State has not yet funded or scheduled a comprehensive bus service study of this nature, the roadway designs for the area in the short term should have more flexibility to accommodate or at least to not preclude options in the future. A comprehensive study of bus services should be required as either part of the planning process for the interchange project or as a separate parallel effort.

Response: Comment Noted. See Section 5.9.

A Better City Testimony (ABCT)

ABCT-1: We are pleased with the great progress that has been made during the Task Force process to date, and we urge the Secretary to require a robust public process during the preparation of further environmental review documents that will include continuing regular meetings of the Task Force. ABC looks forward to continued participation in this productive planning and design process.

Response: Comment noted.

ABCT-2: We are also concerned that adequate access be provided to West Station, including consideration for preserving access to the interchange area and the station for future Urban Ring bus service, with review of the corridor alignment adopted in the Urban Ring environmental review in November 2008, including use of the Grand Junction bridge over the Charles River. Pedestrian, bus, and bicycle approaches to West Station need to be adequate in extent and inviting for all users to encourage use of the station for commuter rail and possible DMU service. In order to accommodate all transportation facilities in the space available, the Grand Junction railroad bridge crossing the Charles River and the approach to the bridge may require use of one track. We think that not enough is known about that question today, and suggest that both one track and two track alternatives should be studied.

Response: Planning for future BRT service on the GJR ROW is beyond the scope of the Project. Access to West Station is discussed in Sections 5.3.5 and 5.7.

ABCT-3: Separate pedestrian and bicycle routes should be provided in a multi-use corridor across the development site, and the network of streets and roadways connecting to and from the Turnpike service roads and ramps should be configured to provide parcelization that will support a range of land uses to be determined in the future.

Response: Separated bicycle lanes and sidewalks are proposed throughout the street grid. The proposed street grid is supported by the Task Force and is informed by the potential for flexibility in future development. The parcel sizes and locations defined by the street grid are favored by BPDA and Harvard (owner and developer). See Sections 5.2, 5.4 and 5.7.

ABCT-4: We believe that the no-build alternative would not be an acceptable solution addressing the transportation and environmental needs of the area, would not provide sufficient mitigation for impacts, and would limit economic growth opportunities. We look forward to reviewing further development of the 3J series of options described in the ENF, and we anticipate seeing progress developing the design elements and enhancements listed on page 7 of the Project Description in the ENF.

Response: The viaduct is in poor condition and even if nothing else is done within the Project, the existing structure will need to be extensively rehabilitated. Chapter 5 includes a No Build Alternative for each impact assessment topic, starting with Section 5.1.1.

A Better City (ABC)

ABC-1: The ENF describes three alternatives for Cambridge Street reconstruction: a two way Alternative, One-way Parallel Street Alternative, and a Two-way Parallel Street Alternative. These represent the best performing sets of alternatives as measured by criteria established during the Task Force process. Each option offers traffic operations advantages over the other alternatives analyzed to date, and each merits further study in the DEIR.

Response: See response to EEA-18. The Cambridge Street alternatives presented in the ENF (the 3J family of alternatives) were carried forward as other modifications were studied and adopted (the 3K family). For opening year (2025) and projected design year (2040) traffic operations the 3K-3 alternative, which is 2-way operation throughout, offers the best travel circulation, access and efficiency compared to the other two alternatives. See Section 3.1.

ABC-2: The structural deterioration of the existing viaduct structure requires complete reconstruction of the I-90 lanes from west of the Boston University Bridge into the Beacon Park area while maintaining existing at grade railroad operations and connections. There may be several alternatives that should be studied for replacing the Turnpike mainline in this area, including the alternative presented to the Task Force that maintained three lanes in each direction in service while reconstructing the viaduct segments across the right of way from north to south. Other options that reduce temporary and permanent impacts on the surroundings should also be developed and their impacts analyzed in order to identify an optimum balance of all considerations.

Response: See Sections 3.3 and 5.8.

ABC-3: The Task Force was very interested in learning of MassDOT's plans to stage the construction and maintain traffic in order to replace the aging viaduct structure in this section of the project. MassDOT presented only one approach to the Task Force: to first build a new two-lane permanent (not temporary) viaduct north of the existing highway, in what we believe is now Section 4 (f) parklands. Some I-90 lanes would shift from the old I-90 to the new permanent viaduct section, allowing for the demolition and rebuilding of the old viaduct sections that had just been vacated by using the new roadways built permanently to the north. This building of new viaduct sections to then vacate old ones would get repeated some five or six times over several years. Many members of the Task Force expressed concerns with this approach. Key concerns seemed to include that MassDOT's approach necessitated: (i) Permanent encroachment and "taking" of Section 4(f) parklands that exist between the existing viaduct and Soldiers Field Road and the Charles River. Both federal and state laws and regulations prevent and discourage takings of parklands for highway purposes; (ii) Multiple so-called "lane splits" on I-90 EB and WB in which half the vehicles traveling in the same travel direction would be forced to split around construction barriers into segregated roadways. Such lane splits on Interstate highways do happen but impact motorist safety and are to be avoided whenever practical; and (iii) Although the taking of Section 4(f) discussed above could be offset by moving Soldiers Field Road close by the new rebuilt viaduct, that road could be moved much farther away from the river and create larger and more useful new open space if no new permanent viaduct were built any closer to the river than what exists today.

Response: For 3K-HV, construction staging in the area between Soldiers Field Road and the viaduct area will result in temporary impacts to Section4(f) land. Following construction the temporarily impacted areas will be restored. Permanent impact to Section 4(f) land that is not currently publicly accessible between SFR and the viaduct includes foundation and column construction. The deck overhead will cantilever over the Section 4(f) land. See Section 5.4 for a discussion of impacts to Section 4(f) Parkland and Table 5.4-2 for a comparative quantification of Section 4(f) impacts for each Throat Area Variation. Figures 5.4.1 through 5.4.9 show impact and creation of new Section 4(f) parkland for each Throat Area Variation.

ABC-4: ABC Alternative 1: One construction staging and maintenance of traffic option that MassDOT has not developed to date but should be evaluated includes a wider temporary viaduct that would be built to the north of the existing highway. See Attachment B-1. All three lanes of I-90 WB would be placed on this wider temporary viaduct. All traffic would then be taken off the old I-90 WB viaduct, creating a very large empty work zone to rebuild that viaduct portion. See Attachment B-2. Once that section of new I-90 viaduct was rebuilt, all four lanes of I-90 EB would be placed on that rebuilt section, similarly creating a large empty work zone to rebuild the now vacated old I-90 EB portion. See Attachment B-3. Once the new viaduct was complete, all lanes of I-90 could be taken off the temporary viaduct that was built to the north, and that viaduct would be removed completely. See Attachment B-4. This alternative approach would require a short-term impact to Section 4(f) parklands, but in the long-term parklands would benefit from not having any permanent new highways remaining in-situ forever and from mitigation measures implemented that would leave a much larger and enhanced parkland adjacent to the Charles River.

Response: The 3K-HV Variation includes a temporary viaduct widening to the north, with the width established as the maximum reasonable width needed to stage the project. Figures 5.21-1 to 5.21-38 provide staging plans for each Throat Area Variation.

ABC-5: ABC Alternative 2: The MassDOT approach presented to the Task Force and the ABC Alternative 1 both involve rebuilding the existing I-90 viaduct by diverting existing highway lanes onto new elevated viaducts built closer to the Charles River. MassDOT should be required to study a third approach that would divert the three existing I-90 WB highway lanes onto the surface (ground level) with no new permanent or temporary viaduct built on the Charles River side of the existing Interstate that runs through this area, See Attachment C-1. MassDOT already commits in the ENF to rebuild Soldiers Field Road in both its WB and EB directions in this viaduct area as part of the Preferred Alternative. ABC suggests that MassDOT be required to study leveraging this rebuilding of Soldiers Field Road by doing that work early, and temporarily relocate the existing pedestrian/bicycle path and Soldiers Field Road tight up against the edge of the Charles River. See Attachment C-2. In doing so, ABC's technical studies suggest that adequate space can be created to house all three lanes of I-90 WB at ground level. No new or temporary viaduct would be needed. See Attachment C-3. The ABC viaduct construction Alternative 2 would avoid any permanent Section 4(f) parkland takings, probably take significantly less time to construct, and more than likely save on construction dollars that might be better spent elsewhere. ABC has completed a preliminary study of this "at-grade" (no viaduct) construction staging and maintenance of traffic approach.

Response: The I-90 west bound components associated with ABC Alternative 2 are included in Throat Area Variation 3K-ABC as well as I-90 east bound.

ABC-6: MassDOT briefly presented to the Task Force several ideas for the future I-90 that might involve replacing the existing viaduct with below-grade or at-grade alternatives. ABC has done some further research on one of those ideas and requests that MassDOT be required to conduct further studies on the feasibility of building no new replacement viaducts and instead place all highway lanes at grade. See Attachment D-1.

Response: See Sections 3.1 and 3.3.

ABC-7: The ENF illustrates a range of alternatives for the interchange, including locations of ramps, service roads, and connecting roads. The 3J series of alternatives strives to optimize traffic flow and addresses objectives of distributing traffic and reducing overloading of intersections; however, there are many other factors such as those cited in these comments and the statements of other commenters that need to be taken into consideration in the further development of the interchange design. These factors should be incorporated and analyzed in the next round of alternative generation or else the performance of the design will fall short of satisfying the multiple objectives of the process.

Response: See Chapter 3.

ABC-8: MassDOT proposes to locate two new main connector roads between Cambridge Street and West Station. Those main new connector roads, which would also provide the main pedestrian and bicyclist accommodations to West Station and across the north edge of the project to the Boston University area, would intersect with Cambridge Street at both Seattle Street and East Drive. We believe that the Task Force process benefited greatly by the involvement of urban designers associated with the City of Boston, Northeastern University, and the Boston Society of Architects. Most of these collaborators suggested these two connector roads be shifted west and intersect Cambridge Street at North Harvard Street/West Connector and Stadium Way to pass over the mainline at a point when it is at-grade to reduce the height of the bridge and the length and slope of the approach road. These suggestions have merit. MassDOT should be required to study this alternative for the location of these two main connector roads.

Response: The Project responds to the criteria set in the I-90 Allston Interchange Placemaking Study developed for the City, and the street grid creates a framework for a future mixed-use neighborhood. See Sections 3.1 and 5.2.

ABC-9: At a minimum, wider decks adjacent to the approach roadways, with landscape treatments that provide wide pathways and perhaps opportunities for vehicles described above. This treatment should be studied in the further development of the West Station and roadway concept.

Response: The approach roadways to West Station are similar in cross sectional features to the street grid cross sectional features, establishing an intended functional and visual unity. Separated bike lanes are proposed in addition to sidewalks. The extent of landscaping within the roadway right of way can be expanded, dependent on Harvard University's willingness to provide the land for it.

ABC-10: It may also be appropriate to consider pedestrian and bicycle approach decks or bridges that are not adjacent to the approach roads, service roads, or ramps to provide further separation from the impacts of buses and other vehicles.

Response: Multiple shared use path alternatives provide pedestrian and bicycle accommodations to and from the south side of West Station. This includes connections from Malvern Street and Babcock Street which are all logical connection points as they each are continuations of the existing streets. See Section 5.7.

ABC-11: If decking or potential air rights construction is to be considered in the future, there needs to be an analysis of methods for providing foundations and substructure. Options for the location and timing of foundation construction should be considered, with appropriate assumptions about future design loads and structural design. Similar provisions for future development were provided in the past in the track and platform area adjacent to South Station.

Response: See responses to Decking/Air Rights/Utilities FAQ and EEA-7, and Section 5.2.

ABC-12: A Better City believes that providing a Bus Rapid Transit connection between West Station and the Commonwealth Avenue side will be important for regional and local public transportation. Adapting the 2008 plan to the reconfiguration of the viaduct, interchange, Grand Junction bridge, and rail yard provides one means for attaining that end.

Response: Planning for future BRT service on the Grand Junction right-of-way is outside the scope of this Project. Access to West Station is discussed in Sections 5.3.5 and 5.7. An analysis of a potential bus-only connection from West Station to Commonwealth Avenue is presented in Section 5.8 and in Appendix C, Traffic Operations Study. However, although construction of this connection is not included as part of the Project, the Project design will not preclude this roadway connection from being implemented by others in the future.

ABC-13: Using MassDOT's own Highway Design Guide parlance, ABC suggests that MassDOT be required to study a People's Pike that deploys a "multiple-treadway" design, in which pedestrians are given their own space, bicyclists are similarly given their own pavement to ride on, with the two user groups separated by some sort of plantings or other street furniture such as street lights, benches, and such. MassDOT spoke with the Task Force about building this new pedestrian/bicycle facility at a width of some 10 feet. ABC believes that this width is inadequate. MassDOT should be required to provide about 25 feet of width throughout this project to properly accommodate a world-class multiple-treadway pedestrian and bicycle off road facility.

Response: Separated bike lanes and sidewalks are proposed. The width of the combined installation exceeds 24 feet.

ABC-14: ABC recommends that MassDOT be required to study the feasibility of temporarily relocating rail vehicles heading across the Grand Junction Bridge via a detour that exists in the suburbs west of Boston. MassDOT should be required to study the feasibility and benefits of making reconstruction and enhancement of the Grand Junction Bridge for all modes happen concurrently with the I-90 Interchange Project.

Response: See response to FAQ 2 Pedestrian and Bicycle. See Section 3.2 for a GJR detour discussion. Rehabilitation of the GJR Bridge over the Charles River is not within the Project scope.

ABC-15: The ABC's Alternative 1 and Alternative 2, which each avoid constructing permanent new viaduct closer to the river than the present I-90 roadway, would both allow for significantly more widening of the parklands upon project completion. ABC estimates this widening can be doubled from MassDOT's 25' to some 50' of new open space, or more. ABC suggests that MassDOT be required to study how our Alternative 1 and Alternative 2 staging concepts might feasibly result in maximizing the width, acreage and quality any new parklands that might be developed as mitigation from the construction of the I-90 project.

Response: See Section 5.4 for a discussion of impacts to open space and Table 5.4-2 for a comparative quantification of open space for each Throat Area Variation. Figures 5.4.3 through 5.4.9 show impact and creation of open space for each Throat Area Variation.

ABC-16: ABC suggests that MassDOT be required to study the implications that might result from their current All Electronic Tolling contract when combined with the design and operations of the I-90 Interchange as proposed in this ENF. ABC further suggests that MassDOT be required to evaluate any new All Electronic Tolling scheme combined with the design of any new I-90 Interchange that retains the agnostic conditions that drivers have historically faced when choosing eastbound routes east of the I-90 Allston Interchange.

Response: Since the filing of the ENF, MassDOT has instituted All Electronic Tolling (AET). The CTPS modeling for this project included assumptions for AET.

ABC-17: As part of urban design and visual studies of the project, MassDOT should be required to study the streetscape and landscape possibilities for new roadways and sites along existing roadways such as Cambridge Street. In addition to the placement of parking to screen pedestrian or bicycle routes, the designs should consider and establish guidelines for street furniture, lighting, local signage, and placement of trees and shrubs to make the local streets as well as the connecting roads, service roads, and ramps an integral part of the new neighborhood. Where additional streets will be added at a future time by others, MassDOT, working with the City of Boston, should establish guidelines that will help to create a unified whole for the area.

Response: Landscaping and streetscaping on Cambridge Street and proposed street grid are included in the Project to the extent feasible. Further refinement and definition of these details will be developed in the final design. See Section 5.3.

ABC-18: As the network of streets and connecting roads is further developed, it is important that blocks and parcels are designed that are rectangular to the extent possible with dimensions that lend themselves to efficient parcelization. Access points for loading docks and garage entrances should be on secondary streets unencumbered with heavy traffic volumes found on connecting roads between ramps and service roads and the major arterials such as Cambridge Street and Stadium Way. Parcelization should also take into consideration grade changes required for connecting roads returning to the surrounding grade from overpasses or other elevated structures. Building designs and entrances will need to work with the grade changes, which may also include changes in the overall ground plane to reduce the barrier effects of elevated roadways. MassDOT should be required to study a range of conditions for the street network and for roadways that it plans to build relative to overall site grading and the placement of buildings on future development parcels.

Response: The proposed street grid is supported by the Task Force and is informed by the potential for flexibility in future development. The parcel sizes and locations defined by the street grid are favored by BPDA and Harvard University (owner and developer). See Section 5.2 for land use.

ABC-19: In conclusion, we believe that the Secretary should consider a range of additional studies and mitigation described above, as well as further refinement of the present alternatives, including all design elements and enhancements listed on page 7 of the ENF.

Response: Chapter 3 includes design evolution and refinements. Chapter 7 includes mitigation.

The Lawrence and Lillian Solomon Foundation (LLSF)

LLSF-1: Thank you for this opportunity to comment on the Environmental Notification Form for MassDOT's I-90 Allston Interchange Transportation Project. We were impressed with the efforts of the MDOT team who worked very hard to balance various demands. While they have found a way to accommodate the traffic flows coming and going to I-90, they have done so in a way that sacrifices pedestrian and bicycle accessibility to the Charles River from the neighborhoods on either side of the turnpike. The alternative also severely limits future development of what ought to be one of the great new districts along the Charles River. The culprit in these two failings is the proposed eastern most ramp from the turnpike that looms over the entire site. By moving this ramp back a block or more, and shortening it, it should be possible to address every one of the following concerns.

1. Development Potential: The design, as proposed, bisects the eastern half of the site along the river with an earthen ramp that is three stories high (35') at the turnpike

and slopes for over one thousand feet. This veritable mountain of earth cuts the future riverside district in two, complicating future development. Where there ought to be a bold new district fronting on the Charles River with rational streets and blocks, instead, there is a narrow and nearly inaccessible strip of land between the steep slopes of the ramp and the edge of the Houghton Chemical rail ROW and Soldiers Field Road.

2. Potential Alternative: Consider aligning this eastern most ramp with Stadium Road, one block to the west. Such a move would lower the elevation and shorten the length of the ramp considerably. The benefits would be: A) potentially lower construction costs, B) a larger and more unified riverside district, C) A better placed on-ramp to Soldiers Field Road, and D) a shorter more efficient loop serving West Station.

Response: See response to EEA-17.

LLSF-2: 2. Pedestrian / Bicycle Access: The proposed design moves the east/west shared-use path (the so called People's Pike) away from the edge of the busy turnpike. This path now has to skirt the edge of the excessively long ramp, mentioned above, before turning south to reach the proposed pedestrian bridge over Soldiers Field Road near the viaduct. This is an excessively long and circuitous route. Likewise, the shared-use path from the BU campus on the south side, while only eight hundred feet from the proposed pedestrian bridge, has to go half a mile out of its way in order reach that destination. Be being isolated the value of the pedestrian bridge has diminished to the point that one wonders if the bridge should be eliminated altogether.

Potential Alternative: By providing a pedestrian bridge over Soldiers Field Road a thousand feet further to the north and shifting the access road onto Soldiers Field Road further south, a much more direct and functional path system can be established.

Response: See Chapter 3 for alternatives and Section 5.7 for bicycle and pedestrian accommodations. The design and siting for this dedicated separated bicycle facility on the north side of Cambridge Street South responds to the advocates of the People's Pike. The design follows the criteria established in MassDOT's "Separated Bike Lane Planning and Design Guide" (2015). Secretary Pollack's introductory letter within the Guide states that it builds on MassDOT's Complete Streets initiative, the GreenDOT Policy Initiative, and the Healthy Transportation Policy Directive to ensure that MassDOT projects increase and encourage bicycle trips. Key members of the project team that produced the Guide included representatives from WalkBoston, MassBike, and the LiveableStreets Alliance. Federal guidance for separated bicycle facilities has been adopted by MassDOT and is presented in FHWA's publication, "Separated Bike Lane Planning and Design Guide (FHWA)", 2015, which is based on national best practices.

LLSF-3: A new Allston Esplanade: We applaud the commitment to moving a 1500 foot section of Soldiers Field Road back from the river in the vicinity of the future viaduct. This will permit the widening of the Dr. Paul Dudley White bike path in that location and provide much needed parkland to help buffer the impact of the new elevated turnpike. The proposal to place a long pedestrian bridge ramp in this narrow set back would cancel out some of these benefits however. Wider parkland is needed to accommodate a pedestrian bridge and maintain room for plantings.

Potential Alternative: Move ALL of Soldiers Field Road fronting onto the former rail yards back from the river by a minimum of 120'. This size setback at the esplanade and the Harvard houses feels sufficient.

Response: The pedestrian bridge over SFR was replaced with an at-grade pedestrian and bicycle crossing over the SFR underpass. See response to Open Space FAQ 1 and 2 and Section 3.1. for the development of the Preferred Alternative. Parkland widths vary by Throat Area Variation and are described in Section 5.4.

Boston Properties (BP)

BP-1: The renewal of the Grand Junction Bridge and its proper connection to the multi-track West Station is inextricably combined with the multimodal transformation of the Allston Initiative in a functional sense. But it is also inextricably entwined as a matter of construction sequencing, as all these components need to be constructed in a very constrained section of land during the next five years, a topic not yet addressed in the ENF. For these reasons, I propose that the project area boundary should be expanded to reach the Cambridge edge of the Charles River, and include the two track rail bridge, and the bicycle and pedestrian connections to link the Cambridge esplanade to the Paul Dudley White trails on the Boston side, at the same time the essential rail connectivity to West Station is installed, and that these elements must be considered as part of the basic purpose and need of the Allston Initiative.

Response: The GJR Bridge over the Charles River is beyond the scope of the Project.

BP-2: Secondly, the ENF does not make a clear commitment to build decking over the I-90 and Rail layup yard and station and tracks as part of the initial construction.

Response: See responses to Decking/Air Rights/Utilities FAQ and EEA-7, and Section 5.2.

Allston Community Groups (Allston)

Allston-1: The study area boundaries do not adequately include adjacent parts of the community where the project will have impacts. The study area boundaries should be modified to permit a full analysis as listed below. The study area should extend to Cambridge Memorial Drive (it now stops at Soldiers Field Road) to incorporate the esplanades on both banks of the Charles River, the reconstruction of the existing structurally deficient two track Grand Junction bridge, and an appropriate pedestrian and bicycle connection between the Cambridge and Boston Esplanades. The proposed stairs and ramps of a new pedestrian crossing adjacent to the river will be partially outside of the presently defined study area, and require a change in the study area boundary to detail the best connections of the new crossing into the narrow strip of land between Soldiers Field Road, the river's edge, and the existing path through the parkland.

Response: See response to MAPC-2.

Allston-2: The study area on the south side of the highway and rail yard should extend to Commonwealth Avenue, because of the need to examine the potential for cross-town pedestrian, bicycle and bus access connecting North Allston to West Station, Commonwealth Avenue and the MBTA's Green Line. The study should include potential changes in land use and employment in and near Commonwealth Avenue, where institutional development will have a significant impact on future pedestrian, bicycle, bus, Green Line, and West Station traffic.

Response: Intersections south of the Allston Interchange, including Commonwealth Avenue, are part of the study area for the interchange option that evaluated a potential roadway connection between the interchange and Commonwealth Avenue. See Sections 4.8.1, 5.8.2 and Appendix C, Traffic Operations Study. Existing and Proposed Land Use are described in Section 4.2 and 5.2 respectively.

Allston-3: Noise and vibration impacts should be studied in adjacent neighborhoods in the Allston sections of the Turnpike reflecting highway, rail storage yard, West Station and rail operations. Noise impact analysis should extend north of Cambridge Street into North Allston along the Lincoln Street frontage of Allston – an area with recurring noise and vibration impacts from the Turnpike. Noise impact analysis is also required, as requested by residents, in the nearby neighborhoods in Cambridge which are particularly exposed to noise from the elevated Turnpike.

Response: See response to EEA-80.

Allston-4: Air quality analyses should be performed for adjacent neighborhoods in both Boston and Cambridge, on all sides of the projects area, but now outside the study area.

Response: See Section 5.10 for the Study Area limits and Appendix F, Air Quality Analysis.

Allston-5: The study area should include Harvard Avenue and Linden Street, Western Avenue, River, Malvern, Alcorn and Babcock Streets, and Commonwealth Avenue for a fuller understanding of traffic and land use impacts. Auto and truck traffic should be examined separately because trucks are not allowed on Storrow Drive and therefore use neighborhood streets for access into the Longwood Medical Area, Back Bay and elsewhere.

Response: The traffic study area includes these roadways. See Sections 4.8.1, 5.8.2 and Appendix C, Traffic Operations Study.

Allston-6: The DEIR should include detailed analysis of current and potential connections between North Allston, Cambridge Street and Commonwealth Avenue to evaluate the possibilities for pedestrian, bicycle, bus and general traffic, improving neighborhood cohesion, and minimizing cut-through traffic that negatively impacts residents and businesses on streets including Cambridge Street, Linden Street and Harvard Ave.

Response: The Purpose and Need has been updated since the publication of the ENF and is included in Chapter 2. MassDOT has considered paths that will serve bicycle and pedestrian movements between Commonwealth Avenue and points north (Cambridge St., Allston Esplanade). Alternatives have been developed with the goal of increasing the transit mode share, and providing local transit connections to the regional transit (Commuter Rail) hub. Refer to Section 3.2.

A discussion of a future roadway connection is provided in section 5.8.2, but construction of it is not included as part of the proposed project. The project will, however, be designed so as not to preclude this connection being made in the future should others wish to pursue it. See Sections 2, 5.7, 5.8.2 and Appendix C, Traffic Operations Study.

Allston-7: The DEIR should examine potential land development patterns and how they are affected by different project alternatives including street layout, vertical geometry of streets and ramps, vehicle and pedestrian access into and out of parcels as affected by ramp vs. street configurations, traffic patterns, and parcel size and depth.

Response: See response to BTD/BRA-32. The proposed street grid is supported by the Task Force and is informed by the potential for flexibility in future development. The parcel sizes and locations defined by the street grid are favored by BPDA and Harvard University (owner and developer). Also see Chapter 3.

Allston-8: The DEIR scope should include the identification of specific actions to mitigate the historic damage to neighborhood connectivity and to establish appropriate connections to support a thriving unified urban district.

Response: See Section 5.6 for a discussion of historic impacts and Section 7.6 for mitigation.

Allston-9: The MEPA scope should reference and flesh out the transportation options and opportunities resulting from this project and emphasize options that provide for user-friendly, pleasant access by walking, biking or taking transit between Commonwealth Avenue and Cambridge Street and connections to the rest of the study area.

Response: See Sections 3.1 and 5.7.

Allston-10: The proposal to completely reconstruct the viaduct to modern interstate highway design standards is stated in the ENF to consist of four travel lanes in each direction, incorporating shoulders and a breakdown lane in each direction. This requires a portion of the viaduct to be built in and/or cantilevered over existing parklands and is the only alternative presented to date.

Alternatives for the design of the viaduct should be clearly stated and analyzed in the DEIR including an option that maintains the viaduct at its existing width and location. This option is preferred by many Task Force members but not included or mentioned in the ENF. The consequence of cantilevering a highway over parkland will raise 4(f) questions and result in air quality and noise impacts to the parkland.

Response: Refer to Section 3.3. Section 4(f) impacts are discussed in Section 5.4, and air quality is discussed in 5.10, for each Throat Area Variation.

Allston-11: Additional options for the design of the viaduct are possible, including an on or below grade which could provide further mitigation for adverse construction impacts from the reconstruction process.

Response: See Sections 3.1 and 3.3.

Allston-12: The I-90 viaduct alternatives should include an option based on a reduced design speed to benefit the land use and open space impacts of the project and improve safety on the Turnpike. Since MassDOT recently constructed the Big Dig with significant variations from FHWA interstate design standards, we know Massachusetts has the capacity and ingenuity to fit highway projects into constrained urban environments in a manner to allow future multi-modal, mixed use and open space benefits to the surrounding community. Big Dig design exceptions explored and implemented in Chinatown, the Financial District, the Waterfront and the North End should be explored in Allston.

Response: See response to EEA-22. Rural segments of the interstate system are typically posted for 65 mph. The portion of I-90 passing through the Allston project area currently has a posted speed limit of 50 mph and will have a reduced urban interstate posted speed of 55 mph at the conclusion of the Project based on the elimination of limiting curvature at the former toll plaza and moving the current alignment further to the south. The Big Dig project involved a high concentration of merging and diverging movements in close succession, frontage roads, collector/distributor roadways, tunnels, and multiple level highway and ramp structures, with all connections requiring guide signs and directive instruction that vehicular operators could read, understand, and act upon safely. In this constrained space, highway design exceptions were necessarily required. All of these elements together required that the Big Dig operating speed be reduced to reach a level deemed safe enough for drivers to travel through the inferior geometry, and for all maneuvers to be adequately seen, understood, and safely executed. Unlike the Big Dig, the interstate highway located through this Project will be connected to the local community through a total of only four ramps, and the next closest ramp is more than 1 mile to the east. Adequate space is available for advance guide signing and for the merging and diverging operations required within the project. Width reductions for lanes and shoulders are either not needed or are needed only to a limited extent to meet the project purpose and need. Highway design exceptions are not intended to be explored, but are available to request should they be required in the event that meeting design standards is not feasible or technically possible. See Sections 3.1, 3.3 & 5.8.1.

Allston-13: “No access” limitations on the proposed ramps and street network options should be revealed in the DEIR, in both maps and text. MassDOT should present alternatives that minimize the extent of these restrictions, as limiting general access to local streets and Turnpike connections negatively impacts land development and will affect roadway speeds throughout the area, which in turn promotes safety for all modes.

Response: See response to EEA-46.

Allston-14: The proposal to move Soldiers Field Road away from the river should extend fully between the BU Bridge and the River Street Bridge to provide new parkland, paths and local street connections. Planning for Soldiers Field Road should be a principal and formative element of the Turnpike interchange project that feeds the roadway, parkland and path network in the new community being created as part of this project.

The Boston Society of Architects has suggested such a park-like entrance to the study area, framed by a crescent relocation of Soldiers Field Road and we request that the MEPA scope include development of such an improvement as mitigation for the construction impact on parkland and as a part of the basic purpose and need of the project.

Response: Alternative 3K-HV provides the greatest separation between roadway infrastructure and the PDW Path that will enable some landscape planting in the Throat Area, but the separating distance is very limited in the Throat Area. See Response to FAQ Open Space and Recreation, and Sections 3.1 and 5.4.

Allston-15: Alternatives studied for the Soldiers Field Road portion of the study area should include: Relocation of Soldiers Field Road away from the river, resulting in new parkland – the Allston Esplanade - and pedestrian and bicycle paths along the river between the Turnpike viaduct and the River Street Bridge.

Response: Alternative 3K includes relocation of SFR mainline to the west and will depress it in a boat section. A new pedestrian connection to the PDW Path will be constructed over the SFR mainline. See Sections 3.1 and 5.7. In addition, all three alternatives - 3K-HV, 3K-AMP and 3K-ABC – include: moving SFR to the west away from the river to create open space; building a depressed roadway section; constructing an overpass at-grade with ramp connections to SFR eastbound and from SFR westbound; and improved pedestrian and bicycle connections to the PDW Path.

Allston-16: New egress and access with Soldiers Field Road’s eastbound traffic to help diminish dangerous conditions at nearby intersections.

Response: See response to EEA-56.

Allston-17: A new pedestrian and bicycle bridge over Soldiers Field Road (this would currently be difficult to build because of limited land at the riverside end of a bridge).

Response: See Response to comment Allston-15.

Allston-18: Westbound access from Soldiers Field Road directly into the westbound turnpike frontage road via a vehicle overpass or underpass.

Response: A direct westbound ramp connection from SFR westbound to the proposed frontage road is not possible, but a connection that goes through only one intersection within the street network is possible as shown on the alternatives. See Response to comment EEA-56.

Allston-19: A new major transit station is a welcome component of the project, and a connection between West Station and North Station via the Grand Junction alignment is already included in MassDOT FY2014 - FY2018 Capital Investment Plan. Options for rail connections under the Turnpike viaduct should be included in the DEIR to assure the feasibility of this connection. Options should include examination of the Charles River rail bridge, (now just outside the study area) along with pedestrian and bicycle routes over the bridge.

Response: Rehabilitation of the GJR Bridge over the Charles River is beyond the scope of the Project. However, the Project is designed in a manner so as to not preclude future use of the GGR ROW.

Allston-20: All options reviewed for the location of West Station should be included in the DEIR, along with a comparative analysis of each location.

Response: Refer to Appendix A, Rail Yard and West Station Alternatives Analysis, for additional information.

Allston-21: Analysis of the options should include, for example, these impacts on residences that abut the rail tracks: Noise, vibration and air quality impacts resulting from anticipated daily train traffic passing through the station, as well as periodic traffic arriving for vehicle services in the rail yard.

Response: Refer to Sections 5.10 and 5.11 for the air quality and noise and vibration impacts, respectively.

Allston-22: Noise and vibration impacts resulting from operations of the proposed power substations, the proposed wheel truing track and building, the proposed pit track, the proposed covered track, the crew quarters, and the proposed car wash.

Response: See response to EEA-80.

Allston-23: Analysis of West Station layout options should include a detailed discussion of potential operations and these effects on design:

Location of head house(s) or other access points.

Response: Appendix A West Station Rail Yard and West Station Alternatives Analysis discusses the proposed station design and location, as well as access points for vehicles, pedestrians and bicyclists.

Allston-24: Ridership using commuter rail services.

Response: Commuter rail ridership projections are described in Section 5.9.3. Additional information on the ridership projections is provided in Appendix L, Ridership Forecasting Technical Report.

Allston-25: Walk-in traffic from both north and south of West Station.

Response: See response to EEA-66. No Parking will be provided at West Station. However, accommodations for taxis and kiss –and-ride drop-off/pick-up activities will be provided at the station's "bus loop".

Allston-26: Bicycle traffic from both north and south of West Station.

Response: See response to EEA-66, and Sections 5.3 and 5.7.

Allston-27: Cross-town or local bus traffic from both north and south of West Station.

Response: See Sections 5.8.2 and 5.9.3.

Allston-28: Idle and temporary bus storage near West Station.

Response: West Station is being designed to account for up to 5 bus layover berths.

Allston-29: Kiss-and-ride traffic from both north and south of West Station.

Response: See response to Allston-25.

Allston-30: A bus or vehicle garage near West Station.

Response: No bus or vehicle garages will be included in the Project.

Allston-31: Service access for West Station and employee parking.

Response: MBTA employee parking will be accommodated within the rail yard. See Sections 3.2 and 5.9.

Allston-32: Efforts to minimize private vehicle access to the station, and emphasize pedestrian, bicycle and transit access.

Response: See response to EEA-66 and Sections 5.3.5 and 5.7.

Allston-33: Examination of local and regional rail and bus services have not yet been provided. All options for potential bus connections across the study area should be explored, and include details of potential connections:

West Station with rail connections to Back Bay, Downtown and the Seaport area via the route to South Station and to Kendall Square, East Cambridge and the Bulfinch Triangle via the route to North Station.

Response: The Central Transportation Planning Staff (CTPS) have completed ridership forecasts for commuter rail, public bus, and light rail based on the assumed redevelopment of BPY and the implementation of West Station. See Appendix C, Traffic Operations Study (Appendix C-2) for more information.

Allston-34: East-west transit, such as express bus services to Back Bay and Downtown via West Station.

Response: See Appendix L, Ridership Forecasting Technical Report, and Section 5.9.3 for West Station bus route assumptions.

Allston-35: Local Buses.

Response: See Appendix L, Ridership Forecasting Technical Report, and Section 5.9.3.

Allston-36: Links to Green Line stations along Commonwealth Avenue.

Response: The Green Line consolidation project planned for the B Line along Commonwealth Avenue will result in two stations remaining in the vicinity of West Station. One stop will be at Packards Corner near the intersection of North Beacon Street and Malvern Street. The other stop will be located at the intersection of Babcock Street with Commonwealth Avenue. MassDOT has positioned West Station and its southerly access points to minimize the distance between West Station and the Green Line.

Allston-37: North-south transit routes, such as a possible Circumferential Bus transit route connecting transit stations such as Harvard Square and Ruggles with alternative, more direct routes to desired employment destinations between Harvard Square in Cambridge, Boston University, Longwood and BU's Medical Center in South End.

Response: See Response to comment Allston-34.

Allston-38: Options for bus routes serving the study area should be examined, including:

- A bus-only or other connection between Cambridge Street and Commonwealth Avenue across the Turnpike and rail yards via Malvern, Alcorn or Babcock Streets.
- Local bus routes, such as Route 66, diverted into West Station.

Response: See Response to comment Allston-34, Section 5.8.2.4 and Appendix C Traffic Operations Study (Appendix C-2 and C-5).

Allston-39: Bus access to West Station is extremely important and should receive special attention in the DEIR. We request that the MEPA scope require a thorough examination of future cross-town, local and express bus services, as well as the use of air rights to provide bus access both to and from the station and the adjacent area south of the station nearer Commonwealth Avenue.

Response: See Response to comment Allston-34.

Allston-40: Proposals for pedestrian/bicycle routes should be made to maximize their potential future use. The DEIR should explore a network of pedestrian/bicycle connections that are not tied to the web of roadways to provide service in the 3,000 foot distance between Babcock Street and the Cambridge Street overpass of the Turnpike.

Response: A 3,000-foot-long pedestrian/bicycle facility between Babcock Street and the Cambridge Street overpass will require a dedicated elevated structure over the commuter rail tracks. The structure provides no connections, but will act as an express facility if included in the Project. At some future time, development of the air rights over the tracks may lead to a need for additional transportation infrastructure that could include this connection, but the immediate need for such a facility in comparison to the proposals already included in the project cannot be justified. See Sections 3.1, 5.3.5, 5.7 and 5.9.

Allston-41: Pedestrian and bicycle connection options should also be examined for Malvern and Alcorn Streets, each very close to the proposed West Station, crossing north-south over the Turnpike and the rail yards.

Response: All three alternatives include bicycle and pedestrian connections between Malvern Street and North Allston, and between Babcock Street and the Harvard development north of Cambridge Street, each passing over the rail yard and I-90. A connection to Alcorn Street will be only approximately 550 feet from the Malvern Street connection and will require a property acquisition. The proposed connection at Babcock Street is nearly 1,100 feet distant from Malvern Street and impacts to buildings or structures will not be required. On the basis of less right of way impacts and a larger connectivity radius, the Babcock Street connection is preferred over Alcorn Street. See Sections 3.1, 5.7 and 5.9.

Allston-42: The DEIR should thoroughly explore options for walking and biking connections between Babcock Street and the Paul Dudley White Path at the easternmost edge of the study area. Details of the Babcock Street connection to the river should show how it may serve as access to and from West Station. Analysis should include required elevation changes to make the connection.

Response: See Sections 3.1, 5.7 and 5.9.

Allston-43: Additional north-south pedestrian/bicycle connections across the study area should result in options that provide access to West Station, BU and the local residential community.

Response: See Sections 3.1, 5.7 and 5.9.

Allston-44: The projected replacement of the existing Lincoln Street pedestrian bridge should be linked to future pedestrian and bicycle routes throughout the study area.

Response: The location of the proposed Lincoln Street bicycle and pedestrian bridge was selected in consideration of several factors, including impact to existing utility infrastructure, right of way impacts, feasible ADA/AAB connections north and south of I-90, existing route location, visibility and safety. See Sections 3.1 and 5.7.

Allston-45: The community has expressed significant concern that roadway connections should be explored that extend from Cambridge Street to Commonwealth Avenue. The DEIR should include an analysis of options that connect Cambridge Street and Commonwealth Avenue that include:

- An option that provides access for pedestrians and bicycles only;
- An option that provides access for buses, pedestrians and bicycles only;
- An option that provides access for commercial vehicles, buses, pedestrians and bicycles only;
- An option that provides access for non-commercial vehicles, buses, pedestrians and bicycles only;
- An option that provides access for all motor vehicle traffic, buses, pedestrians and bicycles.

Response: An evaluation of this connection is provided in the Section 5.8.2.4 and in Appendix C, Traffic Operations Study. MassDOT considered 3 options for this connection: Pedestrian and bicycles only, a roadway open to general traffic (with pedestrian and bicycle access) and a roadway restricted to transit vehicles only (buses, also with pedestrian and bicycle access). The project will provide the pedestrian and bicycle access only option to Malvern Street through the property at 76 Ashford Street. A vehicular connection is not included as part of the proposed project. The Project will, however, be designed so as not to preclude this connection being made in the future should others wish to pursue it.

Allston-46: We request that the MEPA scope require an analysis and comparison of connectivity options between Commonwealth Avenue and Cambridge Street, including access for pedestrians, bicycles, buses, autos, taxicabs and trucks, specifically identifying the impacts on existing problem areas such as Linden Street, Harvard Avenue, Cambridge Street, River Street and the BU Bridge. We also request this analysis to form the basis for an open and transparent discussion with the community of the options that will be carried forward in the Preferred Alternatives for both highway and transit connections.

Response: See response to comment Allston-45.

Allston-47: This large area above the Turnpike and rail tracks, with good regional access and in close proximity to downtown, Longwood Medical Area, Harvard and BU, will generate interest in air rights development from developers and institutions. Air rights are already a major component of the proposal because they must be used to provide access to West Station. We request that the DEIR include specific options for stages of decking, along with an examination of the methods and means to provide for their construction.

Response: Harvard University owns the air rights noted. MassDOT has coordinated with Harvard University to design the proposed transportation infrastructure so as not to preclude Harvard's future development plans within their air rights. See Section 5.2.

Allston-48: The location of the West Station head house, and vehicular and pedestrian/bicycle connections will generate options for future decking. Potential alternative uses for the decks should be explored and footing locations for air rights development should be included in all designs.

Response: See response to EEA-66 and Appendix A, Rail Yard and West Station Alternatives Analysis.

Allston-49: The DEIR should also explore options that use decking to aid in noise and vibration reduction and air quality improvement for nearby residential communities and future development. This is especially important in the area near Pratt and Wadsworth Streets.

Response: Section 5.11 addresses noise reduction benefits to potential decking/air rights development. Because the details of potential developments are not known at this time, a detailed evaluation has not been conducted to quantify the noise attenuation that will be provided or the potential effects associated with the introduction of new noise sources such as rooftop mechanical equipment.

Allston-50: Options for the design and integration of West Station into the surrounding parcels should be studied, including the impact on residential quality of life, accessibility of the station, and economic development opportunities. At a minimum, this study should compare designs for West Station comparable to Back Bay Station, Assembly Square Station and Yawkey Station and the ways they would be affected if they were served by decks over the transportation facilities.

Response: Options for the accessibility of the station are discussed in Section 5.7, Details of potential future development are not known at this time; to not preclude future overbuild activities, the conceptual design provides locations throughout the yard where future foundations and building columns could be placed without permanent impact to the proposed railroad and transit infrastructure. Alternatives for the design of the station are discussed in Appendix A, Rail Yard and Beacon Park Yard Alternatives Analysis.

Allston-51: We urge that the MEPA scope require the analysis of where decking will be most useful, and require that the project include such decking as part of the initial construction, because decking at the time of original construction is most cost effective and least disruptive, and often the only feasible way to protect abutting land uses from adverse noise and visual effects of rail and highway activities.

Response: See response to EEA-7.

Allston-52: New options for the People's Pike should be explored, including likely desire lines across the middle of the study area. The proposed Pike alternatives should be laid out to go through or adjacent to development areas, and to the Charles River in the large triangular study area south of the new, parallel Cambridge Street and north of the Turnpike. This area currently has no proposals for streets and paths east-west through it.

Response: See response to LLSF-2.

Allston-53: Options to be studied for the street cross-sections and the street grid should include a People's Pike with the layout and dimensions of Commonwealth Avenue Mall in Boston's Back Bay.

Response: A separated two-way bicycle facility and sidewalks are proposed along the east-west spine of the project that has been established by Cambridge Street South. The dimensions of the facilities are consistent with the standard of practice for separated bicycle facilities and the City of Boston, and have generally been positively accepted by the land owner and developer from whom property acquisition will be required. See Section 5.7.

Allston-54: Options for a network of connections provided by the People's Pike should be explored. The need to connect North Allston with the Charles River suggests the DEIR should examine a sidewalk and two-way cycle track along the north side of the existing alignment of Cambridge Street. Similarly, to connect North Allston with the new crossing over Soldiers Field Road, a diagonal alignment through the study area should be one of the options.

Response: See response to FAQ Open Space and Bicycle and Pedestrian 1 and 2 and Section 5.7.

Allston-55: The People's Pike is not only east-west. The DEIR should include options for north-south movement, including but not limited to the paths along the Charles River. These alternative routes should connect with other People's Pike alternatives with West Station and Commonwealth Avenue.

Response: The project includes pedestrian and bicycle connections in the north-south and east-west directions within the proposed street network, to and from West Station and Commonwealth Avenue, and with the PDW Path. See Section 5.7.

Allston-56: We urge that alternative routes for the People's Pike be included in the MEPA scope for the project, as the Pike should be a central, formative element and integral portion of the road and street network to be constructed on the site. As it forms a major circulation connection between parkland and residences and new business opportunities that will come to this site, the Pike should not become an adjunct of either Cambridge Street or the Turnpike ramp and main line network, constructed on left over right-of-way.

Response: See responses to Open Space FAQ 1 and 2 and responses to Allston-52 though Allston-55.

Allston-57: The assessment of profile options for the rail lines and I-90 main lines should include lower profiles so that the cross streets connecting to West Station and between Commonwealth Avenue and Cambridge Street could be less steep.
We request that the scope of the DEIR include examination of lower profiles that might be attained by removal of earth contaminated by 100 years of railroad use of the property. We also request that the MEPA scope require a precise discussing of construction sequence of these essential elements.

Response: Track profiles to the west of the Cambridge Street bridge over I-90 approaching the newly constructed Boston Landing commuter rail station are fixed, relatively level to service the station and approaches appropriately, and are not subject to alteration without having to reconstruct that station to a lower elevation. Track profiles within BPY must also be relatively level to appropriately serve proposed West Station and the layover tracks. The maximum possible cut in track elevation within BPY is 3 feet where the layover track is proposed, and this amount of cut is included in the Project. The track elevation, train clearance, and depth of the beams that support the structures passing over the tracks dictate the elevation of the surfaces of those structures. The I-90 profile is as low as feasible to enable the drainage system to treat stormwater for phosphorus removal and then to discharge to the Charles River by gravity. By shifting the alignment of I-90 further to the south as currently proposed in comparison to the alignment presented in the ENF, the distance between Cambridge Street and the structures overpassing I-90 and the most northerly tracks to West Station is increased, thereby decreasing the grade of the connecting streets.

Allston-58: Proposed development plans in the ENF cover only street and highway options. Options for private or institutional development of the blocks formed by transportation routes should be incorporated into the DEIR. Future land use will be an input to all area traffic models, and the DEIR should show, in maps and text, the land use options that underlie the traffic analysis. Densities of development (which could be quite high in this central and very attractive area for development) should be discussed, along with the residential, business, academic development or recreation possibilities in this significant area in the center of the region.

Response: Summary of land use assumptions for the "Project Area" are provided in memoranda from Harvard University & CTPS which can be found in Appendix C Traffic Operations Study (Appendix C-2 and C-3). Description of CTPS trip generation forecasts based on the land assumptions can be found in Section 5.8.2 and in Appendix C, Traffic Operations Study.

Allston-59: Land use patterns should also be examined for their relevance to the design of all roads and streets in the area, in terms of cross-sections, pedestrian and bicycle services, landscaping, urban design and access to developable parcels, whether they give access to residential, business or academic uses.

Response: Proposed street cross sections throughout the street grid have unifying characteristics on purpose, as opposed to a concerted effort to create differentiators, to uniquely establish the area as a "place". These unifying characteristics include, but are not limited to, the paved (bituminous) vehicular environment between the curbs (granite), the separated bicycle environment separated by a patterned surface strip (pattern/color to be collaborated in final design), the pedestrian environment (concrete, scored and potentially patterned for various "place" and destination messages), common signalized intersection equipment color and style as well as travel mode separation characteristics at crossings, street amenities including benches, landscaping, planters, kiosks, corner pocket parks as may be negotiated with the land owner, street light designs, and other features, the details of which will be established during final design. See Section 5.2.

Allston-60: While the provisions of Complete Streets guidelines require sidewalks and bicycle accommodation, certain streets can be expected to have driveways and breaks in adjacent curbs. We request that the MEPA scope of study should define the streets or portions of streets that will not provide access to and from development parcels.

Response: Access to future streets will be determined by Harvard if they elect to develop this area; they will apply to the City for permits to construct curb cuts and associated bicycle and pedestrian access along select stretches of the roadways.

Allston-61: Travelers using vehicles to pass through this interchange include those going to Back Bay, Downtown, Kendall Square, the Innovation District and the Longwood and BU Medical Areas. Private vehicle drivers have many parkway and local street options for distribution, but trucks from around the region are constrained to use Cambridge Street, Harvard Avenue and Brighton Avenue. An investigation of options outside the study area for new Turnpike connections to Park Drive, Beacon Street or other locations should be undertaken by MassDOT as a method of reducing general traffic in the study area and mitigating impacts during the construction of this project. New connections would reduce traffic impacts on neighborhoods which now serve as a pass-through for many trips with destinations outside the area. We request that the MEPA scope require a full exploration of these truck-related issues, and recommend appropriate mitigation of the already unacceptable burdens the current traffic pattern imposes.

Response: Examination of possible new ramps on I-90 at Park Drive or Beacon Street are beyond the scope of this Project and DEIR. MassDOT has previously conducted studies examining this issue and concluded that ramps at these locations were not feasible/practicable.

Allston-62: The western corridor of the region, served by commuter rail, rapid transit, express buses and the Turnpike, remains one of the most heavily used in the region. The Turnpike bears a heavy traffic load and is already congested at many locations in the regional growth centers inside Route I-95/128. Unfortunately, the Turnpike is not expandable and parallel routes are also beyond capacity. If the highly desirable economic growth of the region is to continue, the public transportation mode share must expand exponentially to attract vehicles away from the Turnpike so that it can operate at a more reasonable level of service. We request that the MEPA scope include a requirement for development of an overarching regional context with public input for use in evaluating the planning and design options in Allston.

Response: Consideration of regional planning is included in the appropriate document sections. Public comment continues to be welcome through completion of the MEPA process.

Allston-63: The area around the I-90 Interchange project includes the currently vacant rail tracks known as the Beacon Park Yard, proposed in the South Station Expansion Project (EEA number 15028) to become a major rail layover facility and in this ENF to become the principal layover facility for MBTA commuter rail trains to and from the West/Southwest. The analyses of the South Station/Beacon Park Yard Layover Facility should be included in the DEIR to show its relationship to the rail network, West Station and the I-90 Interchange project, and also the additional impacts brought to the site by the layover facility.

Response: Section 5.9 presents the environmental impacts resulting from the proposed BPY layover facility. This section also includes a discussion of railroad operational impacts and connections between the proposed layover facility and the surrounding rail network and West Station.

Allston-64: The current document for South Station and the Layover Facility points toward potentially severe impacts of noise, vibrations and air quality within short distances from adjacent residential areas along Pratt and Wadsworth Streets. The DEIR should provide a detailed map of the proposed layover facilities for commuter rail services and the need for including facilities that may generate severe impacts on adjacent residences, such as the proposed wheel truing track and building, the proposed pit track, and the proposed covered track. The DEIR should demonstrate how these and other impacts are magnified by the addition of noise, vibrations and air quality issues from the highway relocation and the new West Station, and how these impacts might be abated by alternative locations for each of these facilities at this site or elsewhere.

Response: See response to EEA-80.

Allston-65: We are pleased to note that the South Station Expansion Project includes a role for Widett Circle as a layup facility closer to South Station. We request that the MEPA scope include an analysis of the degree to which a more robust facility at Widett Circle might permit some reduction in size of the new facility proposed for Beacon Park Yard, which could allow more flexibility to mitigate noise and other proximity effects, and consider requiring this modification as a mitigation measure in the study area.

Response: An analysis of Widett Circle is outside of the Project scope. Readers are referred to MEPA Project File 15028 – South Station Expansion Project for details on the MBTA's Commuter Rail Layover needs and Beacon Park Yard's role in efficiently supporting layover needs in conjunction with potential facilities at Widett Circle and an expansion at Readville.

Allston-66: Removing a significant highway interchange is complicated and will involve many steps to accomplish safely for all users – highway, pedestrian, bicycle, bus, rapid transit and truck. The staging of construction should be detailed in the DEIR, to report on potential influences of staging on the final design of street networks and ramps, land development, pedestrians, bus and bicycle ways. Staging of construction has not yet been discussed, and both the area and the project are very complicated. Thus, staging should be considered an ever-present and potential reason for modifying the design and should include detailed discussions with the community.

Response: Conceptual construction staging is presented in Section 5.22. The layout of the proposed street network is independent of construction phasing.

Allston-67: MassDOT should evaluate how its proposed improvements further the following Commonwealth of Massachusetts policy goals and how these goals work together to mutually reinforce one another and strengthen the Commonwealth's efforts to reduce its dependence on single occupant vehicles. These policy goals are embedded in the MassDOT Transportation Impact Assessment (TIA) Guidelines, instituted in March of 2014.

1. MassDOT Mode Shift Goals
2. MassDOT's Design Guide Standards on Complete Streets
3. The Global Warming Solutions Act
4. The Massachusetts GreenDOT Policy Initiative
5. MassDOT's Mode Shift Initiative
6. The inter-agency Healthy Transportation Compact
7. The Healthy Transportation Policy Directive
8. The Massachusetts Ridesharing Regulation
9. MassDOT's Safe Routes to School

Each of the above policy initiatives must be supported through implementation of project elements that provide for a multi-modal transportation development review and mitigation process. These elements emphasize transportation-efficient development and enhancement of transit, bicycle, and pedestrian facilities, as well as foster implementation of ongoing, effective Transportation Demand Management programs. We request that the MEPA scope require explicit use of these policies as drivers of planning and design as well as evaluation criteria for decision-making.

Response: Concept development to date and detailed design going forward includes full consideration of the nine above-referenced MassDOT Transportation Impact Assessment Guidelines.

Allston-68: In light of the investment in getting conversant with complex technical issues which has been made by the existing Task Force members, we propose that MEPA reconstitute the existing Task Force as the Project Area Committee for the remainder of the environmental process, development of design build contracts and eventual oversight of implementation. To ensure continuous community monitoring, we recommend that the Secretary follow the precedent established by the September 14, 2007 certificate establishing a special review process for the Harvard University – Allston Campus 20 year Master Plan and create a Citizens Advisory Committee that should be empowered to:

- Meet with MassDOT and its consultants on a monthly basis.
- Hire its own third party consultant to review and evaluate MassDOT's Preferred Alternative and other related proposals and be supported with a budget of $300,000 provided by MassDOT to fund the consultant who will work for and under the direction of the CAC.

Response: Comment noted. MassDOT has contributed funds for independent third party review and the BPDA Placemaking Study.

Allston-69: We have been concerned to hear some discussion that only the highway portions of the Allston initiative have secure funding and fear that fundability could be a basis to undermine the environmental integrity of the process. We realize that project funding is not usually a part of MEPA review, but we believe that this project is unique and can readily be built in an integrated manner that will result in savings from designs that are interrelated and construction. This is true of not only the public expenditures, but also those of private developers and the principal landowner of the study area. We request that the MEPA scope include exploration of public/private methods of constructing the transportation facilities, including the required transit, pedestrian, bicycle and open space facilities, as well as early decking to promote air rights development over the transportation facilities.

Response: A cost estimate for the Project is provided in Section 5.22.2. While the MEPA process is proceeding, MassDOT is assembling a finance committee that will consider the various options available for financing and ultimately funding the Preferred Alternative, including public financing, public-private partnerships and third party contributions. Toll revenues can only be used on the tolled facility and likely cannot be used for rail, bike and pedestrian facilities. Though Project financing is an important factor to be used in the final determination of a complete Preferred Alternative, it is only a factor. The assessment and analysis of environmental impacts has been performed independent of cost implications and should be reviewed accordingly.

Boston Society of Architects (BSA)

BSA-1: Include green stormwater infrastructure as an integrated component of the MassDOT contract (that anticipates a future central open space).

Response: To the extent practicable, based on space constraints, oil and hazardous materials, groundwater elevation, and soil type, the final stormwater management system will be designed to be in conformance with the MassDEP Stormwater Standards, which includes LID or 'green' design measures. See Chapter 5.17 and response to BTD/BRA-8.

BSA-2: Move the West Station access streets further west to reduce the height of the bridges and berms, making them more pedestrian-friendly. This will create more land for development facing the Charles River.

Response: Section 3.1.3 describes the design modifications since the ENF filing. See response to NU (ARCH-2).

BSA-3: Align the southern terminus of the West Station access streets with Malvern and Alcorn Streets to allow for future direct pedestrian and bicycle access.

Response: Pedestrian and bicycle access is provided at Malvern Street and Babcock Street. See Sections 5.3.5 and 5.7.

BSA-4: Consider the creation of a waterfront park along the Charles River by realigning Storrow Drive.

Response: See response to FAQ OS 1 and Section 5.4.

BSA-5: Study West Station to ensure that multi-modal connectivity is established from both north and south including opportunity for Bus Rapid Transit and DMU Service.

Response: West Station will be situated to provide multi-modal connectivity, including bus bays for regional and local routes along the station's access loop, and pedestrian and bicycle structures in the north-south direction from the BU neighborhood. DMU service in the station is not precluded and may be accommodated in the future. Planning for future BRT service on the Grand Junction right-of-way is outside the scope of this Project.

BSA-6: Of the schemes included in the ENF, Alternative 3J is preferred by the BSA as it reduces the width of Cambridge Street to a better scale by providing a second parallel street. That said, Multimodal Connectivity (p9-25) must be addressed particularly as it relates to the current plans.

Response: I-90 Urban Interchange 3K Preferred Alternative provides this second parallel street (Cambridge Street South) along an improved alignment further south to better accommodate Multimodal Connectivity within the Project area. i.e. Pedestrian and bicycle connectivity between Cambridge Street/North Harvard Street and the Charles River along north side of Cambridge Street South. Section 3.1.3 describes the design modifications since the ENF filing.

BSA-7: The proposed flyover ramps to West Station will not be pedestrian friendly in their current location and geometry and will effectively create a giant wall in front of the Charles River.

Response: See response to EEA-17. Section 3.1.3 describes the design modifications since the ENF filing.

BSA-8: Future development in the Project Area will be adversely affected by the East Drive Connector Ramp alignment in all Alternatives 3E through 3I.

Response: Alternatives 3E through 3I were eliminated during the ENF preliminary screening of alternatives with Alternatives 3J-1, 3J-2 and 3J-3 selected for further evaluation. Section 3.1.3 describes the design modifications since the ENF filing.

CITIZEN COMMENTS

Bradley Frank/Ehren Foss (BF/EF) – Note the letters contained the same comments.

BF/EF-1: MassDOT should completely integrate planning and construction of the relocated Pike and the new West Station.

Response: West Station has been integrated into the design of the Project, as well as the planning and travel forecasts for the Project. See Section 3.2.

BF/EF-2: In the area of West Station, the Turnpike and rail lines should be decked over to enable Smart Growth development on these several acres, so that there can be attractive and useful pedestrian, bicycle and bus access to West Station and between North and South Allston, and to minimize the impact of the rail yard and highway on nearby residents.

Response: Decking is linked with future air rights development by the property owner. The proposed project does not preclude future decking by Harvard. See responses to FAQ Decking/Utilities and EEA-7 and Section 5.2.

BF/EF-3: A wide riverside park, the "Allston Esplanade," should extend between the BU Bridge and the River Street Bridge.

Response: See response to FAQ Open Space 1 and 2.

BF/EF-4: Where Soldiers Field Road is parallel to the Turnpike, it should be placed below the Turnpike viaduct to allow a widening of the park along the Charles River. The Turnpike viaduct should not be widened beyond its current width and should not encroach on the Charles River parkland between the viaduct and Soldiers Field Road.

Response: Chapter 3 provides alternatives analysis for the throat area, including a description of the roadway width and layout. Section 5.3 provides cross sections showing the extent of each roadway layout in relation to the Charles River. Preferred Alternative 3K Throat Variations 3K-HV, 3K-AMP and 3K-ABC encroach on the Charles River parkland between the existing viaduct and SFR. Viaduct widening associated with 3K-HV results in the least amount of parkland impacts while 3K-AMP and 3K-ABC have the greatest impacts due to the direct placement of I-90 on the parkland. Also see Section 3.3.

BF/EF-5: The Turnpike viaduct should not be widened beyond its current width and should not encroach on the Charles River parkland between Soldier's Field Road (on a new bridge structure) and into the Allston Esplanade.

Response: Preferred Alternative 3K Throat Variations 3K-HV, 3K-AMP and 3K-ABC encroach on the Charles River parkland between the existing viaduct and SFR. Viaduct widening associated with 3K-HV results in the least amount of parkland impacts while 3K-AMP and 3K-ABC have the greatest impacts due to the direct placement of I-90 on the parkland. See Sections 3.3, 5.3 and 5.8.

BF/EF-6: Pedestrian and bicycle paths should extend across the project area, across Soldier's Field Road (on a new bridge structure) and into the Allston Esplanade.

Response: See Section 5.7.

BF/EF-7: MassDOT should have an ongoing planning process for the Turnpike Relocation and West Station that involves residents and advocacy groups that continues through the project's construction.

Response: See response to CCD-13.

Anthony Toppi (AT)

AT-1: North/South passage between Allston Village and Lower Allston over the pike is absolutely vital: a pathway that accommodates all modes of transportation will greatly improve not only the local residents lives (as it will relieve traffic congestion on the Allston Main Streets area) but also improve the lives of non-city residents as they try to navigate the connections between Newton, Cambridge, Brookline and Boston.

Response: An evaluation of this roadway connection is provided in the DEIR, but construction of it is not included as part of the proposed project. The project will, however, be designed so as not to preclude this connection being made in the future should others wish to pursue it. See Section 5.8.2.4 and Appendix C, Traffic Operations Study.

AT-2: Preserve, enhance, and enlarge available green space. Allston has more river frontage that any other neighborhood in Boston, yet it has the least access because of poor planning and private land owners. The I-90 Interchange should be constructed so that green space is enhanced and enlarged. It's nonsensical to not include that into any major transportation development plan in Boston: we have the knowledge, the desire, and the partners to do it.

Response: See response to FAQ Open Space 1 and 2 and Section 5.4.

AT-3: Encourage community input: the size and scope of the project merit continued community development through to the project's completion.

Response: See response to CCD-13.

Alexandra Reisman

AR-1: I'd like to echo the comments of the People's Pike regarding the Allston I-90 project. Additionally, I feel strongly that the plans for West Station must be very pedestrian and bicycle friendly, with protected bike, lanes and generous sidewalks with lots of trees and greenery. Plans I had seen for the station looked pretty retrograde, like a highway with two skinny sidewalks. This was very dismaying and I hope the final plans greatly expand pedestrian and cyclist access, safety and comfort.

Response: The approach roadways to West Station are similar in cross sectional features to the street grid cross sectional features, which provide 8-foot wide sidewalks and bicycle accommodations, establishing an intended functional and visual unity. Separated bike lanes are proposed in addition to sidewalks. The extent of landscaping within the roadway right of way can be expanded, dependent on Harvard University's willingness to provide the land for it. Also, see responses to EEA-28 and EEA-66.

James Fogel

For responses to remaining comments by Fogel, see Form Letter Responses at the end of this section.

JF-1: Encourage high-density housing development to help address housing affordability issues.

Response: Development of the parcels created by the proposed street grid is dependent on the land owner, Harvard University. See Section 5.2. The Project is highway related and does not include nor influence housing.

Andreae Downs (AD)

For responses to remaining comments by Downs, see Form Letter Responses at the end of this section.

AD-1a: Acres of new parkland along the Charles River (the “Allston Esplanade.”) As you probably know, this would also help catch & clean run-off from Storrow which now pollutes the Charles.

Response: See response to FAQ OS-1. Section 5.17 discusses water quality associated with runoff from the Project.

AD-1b: A new ‘West Station’ transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square—we in Newton are also hoping this unlocks the full potential of current stations in Newtonville, Auburndale and West Newton, while possibly allowing for new ones at Newton Corner and Riverside—all of which would reduce demand for Pike lanes.

Response: See response to FAQ West Station 1 and Section 5.9.

Steve Leibman (SL)

SL-1: Take advantage of this opportunity to add parkland and multi-use community paths; improve bicycle accommodations on the streets on the scope of the project area.

Response: Description of proposed pedestrian/bicycle facilities is provided in Sections 5.3.5 and 5.7. A description of the proposed transit improvements is provided in Section 5.9. Parkland opportunities are provided in Section 5.4.

Christina Long Marin (CM)

CM-1: As a homeowner in North Allston who relies on bikes and public transportation to get to work, I am requesting the final design be just as cognizant to the movements of pedestrians and users of public transportation as it is for the drivers of cars.

Response: Refer to Sections 5.3.5 and 5.7.

CM-2: My greatest concern with the current design is the West Station is placed far from the commercial hub of North Harvard Street. I’d like to see the station placed directly below the Cambridge Street bridge to accommodate and cater to current pedestrian traffic as well as established retail and minimize foot traffic in residential neighborhoods.

Response: Refer to Section 5.9 and Appendix A, Rail Yard and West Station Alternatives Analysis.

CM-3a: I agree with my neighbors on the following points and urge you to require the final plans do the following: Incorporate acres of new parkland along the Charles River called the “Allston Esplanade.” As a 26-time marathon runner, I’ve had many near-misses with bikes and pedestrians during training runs — the bike path is not wide enough to meet pedestrian demand. It’s a safety hazard. This is an excellent opportunity to fix it.

Response: Refer to Sections 5.3.5 and 5.7 for descriptions of the additional parkland opportunities and bicycle and pedestrian connections.

CM-3b: Prioritize the construction of a new ‘West Station’ transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square. It’s time rail service was restored to Allston.

Response: The Project includes West Station as an integrated component of the new transportation infrastructure. See response to FAQ West Station 1 and Section 5.9.

CM-3c: Consider land use of the developable parcels that are opened as a result of this project and how the roadways will cater to a ‘sense of place’. Allston has the potential to be much more than a highway off-ramp and speedway for cars.

Response: Consideration of future access to future development parcels is integral to the roadway network design in terms of street widths, accommodations for pedestrians etc. The Project responds to the criteria set in the I-90 Allston Interchange Placemaking study developed for the City, and the street grid creates a framework for a future mixed-use neighborhood. See Sections 3.1, 5.2 and 5.3.

Robert La Tremouille (RLT)

RLT-1: It is my understanding that the southern boundary of the viaduct will be rebuilt in place. This is excellent because it retains the possibility of running a Green Line spur off Green Line B just west of the BU Bridge which could connect to Harvard Square with stops at Boston University, Harvard Medical School, North Harvard and Cambridge Street, North Harvard and Franklin Street, and at Harvard’s Business School/Stadium. A proposed map is attached. I have published photos of the area where the Green Line spur could go. Clearly, building a streetcar line in this area would be close to Boston University buildings, but no building need be harmed, plus Boston University would get a stop at the level of their plaza in the new residential housing behind their sports arena, and would get convenient transportation to and from Harvard Square. On the Harvard Square end, the streetcar line could connect into the existing Harvard Station complex in a subway tunnel which remains from the days when Red Line trains were stored between Harvard Square and Memorial Drive. Direct connection to the busway would be simple since the only separation is a not overly thick wall.

Response: Comment noted.

RLT-2: Environmentally destructive people have argued for connections to the Grand Junction railroad bridge which would be environmentally destructive on the Cambridge side of the Grand Junction bridge. MassDOT has been wise to reject this proposal.

Response: Comment noted.

RLT-3: The South Station planners’ position on the layover yard proposed as part of the Massachusetts Turnpike Allston facility is that they can live with it for layover of trains from the west. The mentality here exactly fits their mentality at South Station. They can survive with the layover yard as proposed. It is nothing great and it leaves no room for expansion, but they can live with it. As far as they are concerned the current expansion effort is the end of expansion of South Station service, and thus there would be no value for larger layover service. The South Station planners are of the understanding that the layover yard has to be located between the relocated Massachusetts Turnpike and the residential neighborhood. The South Station planners have not even thought of splitting the layover yard with the proposed part between the Mass. Pike and the neighborhood and with additional layover yard space on the far side of the Mass. Pike, to allow expansion in the future. The South Station planners apparently are aware of the plans for the primary area but do not have an understanding of its relationship to the viaduct. The tracks from South Station come in to the primary area from under the viaduct. Creating a switch under the viaduct so that layover trains could be directed to layover tracks on either side of the relocated ground level Mass. Pike would be simple. Easy and effective, and in sharp contrast to a situation which I hope will be corrected at South Station, allows for future expansion, this would allow further expansion of rail service at South Station.

Response: There are no plans to extend additional or separate train storage facilities to the north of the proposed highway, as this land is privately owned and slated for future development.

RLT-4: West Station: This, along with at least one other station, is being sold as some sort of improvement to transit facilities available to the neighborhood. This, to me, makes no sense to the neighborhood. The neighbors have not had a meaningful explanation of the very severe limits of commuter rail. Commuter rail service normally is almost totally rush hour service, Monday to Friday. The hours, availability and accessibility limits of West Station are such that folks are very much not likely to use West Station. They will find preferably bus transportation to rapid transit at Harvard Square, Central Square and Allston Village more convenient and ALWAYS available at least by bus.

Response: Refer to Sections 2.1.3 and 3.2.

RLT-5: Additionally, the planning mentality at South Station makes it unlikely that South Station will be able to receive the new traffic. Thus the only viable route for West Station traffic would be through Cambridge. The Cambridge route is environmentally destructive, and destructive to the existing traffic because of its blocking of multiple major roads in Cambridge. I am enclosing a map of the conflicts. This is a map of the Grand Junction in Cambridge prepared by MIT. I have added arrows pointing out the major roads which would be directly impacted. MassDOT has studied passenger service on the Cambridge route and found passenger service on this route of no value to any location except for Kendall Square.

Response: While the proposed West Station is being designed so as to not preclude future use of the Grand Junction right-of-way for passenger rail service, the implementation of passenger rail services along the Grand Junction through Cambridge is outside the scope of the Project.

RLT-6: Since there is no other apparent route which West Station traffic would use, failure to evaluate environmental impacts of trains being serviced by West Station is very clearly segmentation.

Response: The environmental impacts associated with West Station are considered part of the Project and any impacts are discussed in Chapter 5.

RLT-7: Two things are necessary to properly support a Green Line A spur.

(a) An area set aside for layover yard of their own located adjacent to the expansion of the South Station layover yard on the Cambridge Street side of the relocated Mass. Pike.

(b) Preliminary tunnel construction under the work area, plus allowance at the West Station site, with or without West Station.

Response: The analysis and accommodation of a new Green Line spur is outside the scope of the Project.

RLT-8: The plans for South Station Expansion are deficient because they do not allow any room for any expansion beyond South Coast rail. There seems to be exactly zero room after that. Alternatives are proposed by me which should be considered. With the current plans, new commuter train service which should go to South Station will have NO CHOICE but to go over the Grand Junction with major environmental destruction in Cambridge, starting with commuter rail traffic generated by West Station. Failure to include analysis this totally new passenger route which is forced by the inadequate planning at South Station constitutes segmentation, both for interference with traffic on major Cambridge arteries and for environmental harm and increase of existing heartless animal abuse on the banks of the Charles River. Cambridge and the Department of Conservation are already practicing heartless animal abuse on the banks of the Charles River targeted at long term, valuable and popular resident animals. Analysis should include the DCR's policy in its "Charles River Master Plan" of killing off or driving away all resident animals on the Charles River Basin.

Response: Comment noted.

RLT-9: It is segmentation if the analysis does not include passenger traffic in East Cambridge. Highway Conflict. [Chapter 4 of the South Station analysis]. Below is MassDOT's map of the Grand Junction railroad in Cambridge taken from an MIT submittal. I have added thick markings of intersection conflict with existing road traffic. As stated in my I-90 Allston analysis, where will West Station trains go?

Response: Refer to Section 5.9.

RLT-10: It is segmentation if the analysis does not include passenger traffic in East Cambridge.

Response: Refer to Section 5.9.

Jeffrey Orlin

For responses to remaining comments by Orlin, see Form Letter Responses at the end of this section.

JO-1: I notice that the project includes creating breakdown lanes where they don't exist. There are many places on this stretch of the highway where there aren't breakdown lanes and it's not clear to me why it is so important to add them to this small stretch. If they are really that important, shouldn't they exist everywhere (they can always be created from a travel lane)?

Response: Refer to Section 5.8.1.

Robert and Paula Alexander (RPA)

For responses to remaining comments by Alexander, see Form Letter Responses at the end of this section.

PRA-1: We would like to see a truly viable plan on how the traffic will flow.

Response: The proposed roadway network will include 3 new north-south roadways between Western Avenue and Cambridge Street (Stadium Way, Cattle Drive and East Drive) that will result in reduced traffic on North Harvard Street. In the Preferred Interchange 3K-HV, the projected 2040 volumes on North Harvard Street will be 34% less than existing volumes in the AM peak and 19% less in the PM peak. The traffic flow is described in Section 5.8 and Appendix C, Traffic Operations Study.

PRA-2: There should be better speed signage posted along North Harvard Street to control speeders and enforced by police or BTD.

Response: Enforcement of existing posted speed limits is the responsibility of the City of Boston.

PRA-3: There are too many traffic signals on North Harvard Street causing delays and back-ups. Starting at Cambridge Street, there is a signal, drive north towards Western Avenue and there are 3 more signals within a quarter of a mile. The signals at Franklin Street should be removed. There has recently been a bump-out installed on Franklin Street to slow the traffic down and this light is no longer needed. It causes significant problems for the residents at this intersection, i.e. diesel fumes and vibration from idling buses, trucks, heavy vehicles waiting for the light to change. Residents on Franklin and North Harvard Streets cannot get out of their driveways, and the noise pollution is unbearable. It is so bad we cannot open our windows in the warm weather.

Response: The signals and traffic calming devices referenced in the comment letter are outside the interchange project area and are the responsibility of the City of Boston not MassDOT. The BTD should be contacted regarding these concerns.

PRA-4: The MBTA bus stops need to be reconfigured so that there are no stops directly across from each other. One of the worse bottlenecks is at this intersection of Franklin, No. Harvard and Kingsley Street and presents another cause of traffic congestion when buses are stopped in both directions simultaneously.

Response: The MBTA and the BTD should be contacted with concerns regarding bus stops on North Harvard Street that may have impacts on traffic flow.

Tom Lamar (TL)

For responses to remaining comments by Lamar, see Form Letter Responses at the end of this section.

TL-1: A commitment to construct an "urban interchange" with a tight street grid and intersections at approximately 90 degrees, rather than a "suburban interchange" with deadly highway-style merges between Cambridge St and the Mass Pike ramps.

Response: The 3K Preferred Alternative reflects an urban interchange design.

Priscilla Anderson (PA)

For responses to remaining comments by Anderson, see Form Letter Responses at the end of this section.

PA-1: I also feel strongly that the Charles River is a vital, living place, and that the flora and fauna that live there need to be protected and, in fact, encouraged to survive, so I want to see underpasses and lots of trees/bushes as opposed to large swaths of grass that needs to be mowed.

Response: A section of SFR is proposed in an underpass configuration. Landscaping is a final design task and the details will be coordinated at that time with DCR.

PA-2: Mass transit via bus needs to be improved, especially the 66 bus (a long route that gets clogged up going through Allston), so the idea of creating through roads from Comm Ave to Cambridge Street could help alleviate that problem.

Response: At this early planning stage, it is anticipated that in the future the Route 66 bus would use Stadium Way instead of North Harvard Street.

PA-3: I also live on a "through road" between Cambridge St and Western Ave that should not be used by commercial traffic, but because the neighborhood is not well-designed, we are awakened by large trucks and construction vehicles every morning. I'd like to see a new neighborhood design that makes the commercial truck route clear and convenient for them, and thus make our residential areas cleaner and quieter.

Response: The proposed roadway network will include 3 new north-south roadways between Western Avenue and Cambridge Street (Stadium Way, Cattle Drive & East Drive) that will reduce the need for drivers to cut-through residential neighborhoods.

Drew Volpe (DV)

DV-1: As part of the project, I would like to see MassDOT look at providing more options for cycling, walking, and public transit. Too often, these get overlooked and done as an afterthought. In particular, I think it would be worth exploring new public transit and cycling options that connect Allston to downtown and/or Kendall.

Response: Refer to Sections 5.7 and 5.8.

John Eskew (JE)

For responses to remaining comments by Eskew, see Form Letter Responses at the end of this section.

JE-1: .This stretch of the Charles River along I-90 is a wasted opportunity which adds nothing to the lives of adjacent residents. The path is barely large enough for two bikes to pass in opposite directions - even without pedestrians present. I urge you to right this past wrong and expand the river path into a real esplanade that allows for a commute by foot or bike while offering recreational opportunities for all city residents.

Response: Separated bike paths and sidewalks are part of the Project where feasible see Section5.7. All three Throat Area Variations offer opportunities to create additional parkland as discussed in Section 5.4.

Rita Vaidya (RV)

For responses to remaining comments by Vaidya, see Form Letter Responses at the end of this section.

RV-1: Reduce impacts on the neighborhood both during and after construction.

Response: See response to comment BTD/BRA-27 and refer to Sections 5.21 and 7.21. Traffic impacts from construction vehicles will be controlled by construction contract specifications. Provisions are typically included to prohibit construction traffic on local streets unless authorization is given for specific instances in coordination with local officials.

Carol O'Hare and Walter McDonald (CO/WM)

Note that the following Cambridge residents wrote in agreement with the comments noted below:

Jane Stolzman
Marc Hoffman
Phyllis and Harvey Baumann
Peggy Lynch and Jan Puibello
Decia Goodwin
Ibby and Charlie Kurzon
Kristin Canavan and Ross Berbeco
Carolyn Shipley
John Shetterly
Jim Moore
Larry Kontos
Tom and Karen Norton
Philip R. Olenick
Colleen Clark
Laura Kershner
Brian Conway

CO/WM-1: Since the start of the public process for this Project, Cambridge's interests seem to have been an afterthought. At the start of the public process, it required the intervention of our State Reps and City officials to get Cambridge members appointed to the Project's 40-member Community Task Force. Even the official Project name – "Allston I-90 Interchange Project" – reflects this seeming disregard by implying that the Project will only involve the redesign of the Turnpike's Allston Interchange. In fact, a significant component of the Project involves the major repair/construction and widening of the Viaduct just across the river adjacent to B.U.'s West Campus.

Response: Producing comment letters on this DEIR is the next recommended opportunity for Task Force members and stakeholders to continue to participate in the development of the Project. Comments on the DEIR will be considered by MassDOT when selecting one of the three Throat Area Variations and considering further Project refinements to completely define a Preferred Alternative to be described in the Final Environmental Impact Report (FEIR). Comments will also be sought on the FEIR. Subsequent opportunities for public input will occur during the Project design phase, including design public hearings.

CO/WM-2: Allston/Cambridge Toll—Booth Removal: This is to happen even before the Project commences. That will help reduce truck noise, especially. No rev-up, rev-down, gear or braking noise for the toll booths.

Response: Comment noted.

CO/WM-3: Possibility of noise-deadening Paving Materials or Treatments.

Response: Research over the past 10-20 years of the potential noise reduction from different pavement materials and pavement textures has shown that noise reduction of 5 dB or more can be achieved compared to standard pavement; however, these pavements do not effectively reduce noise throughout the life-cycle of the pavement and meet other specifications such as those associated with water spray friction, and maintenance. Based on this research, the FHWA has issued guidance that "The deterioration in noise reduction properties of pavements over time results in the abatement measure no longer fulfilling its intended abatement commitment and would be required to be replaced." Therefore, FHWA noise regulation (23 CFR 772) does not allow for the use of pavement type or surface texture as a noise abatement measure.

CO/WM-4: Incorporation of Noise barriers into the Project Design.

Response: See response to EEA-80.

CO/WM-4a: Retrofitting/installing sound barriers, especially along the raised Viaduct, in high-traffic conditions at some future time seems totally improbable. Retrofits are rarely, if ever, as effective as comprehensive, initial engineering designs for the same function/purpose.

Response: See response to comment EEA-80.

CO/WM-4b: Noise Barriers: DOT is exploring various types. Here's why it's essential to incorporate noise barriers into the Project design and cost at the outset (for Cambridgeport & Riverside, particularly the raised "Viaduct"). Retrofitting/installing sound barriers, especially along the raised Viaduct, in high-traffic conditions at some future time seems totally improbable. Retrofits are rarely, if ever, as effective as comprehensive, initial engineering designs for the same function/purpose. If noise barriers are not installed as part of the Project, Allston/Cambridge/Riverside neighborhoods will have, practically-speaking, an endless wait. They'll have to compete with other Massachusetts communities for woefully insufficient funds under DOT's Noise Abatement Programs.

Response: See response to comment EEA-80.

CO/WM-5: Reduced Speeds: We would think that speed-reduction to the east of the Allston interchange would reduce accidents, swerves and sudden braking screeches/grinds, all noisy, not to mention injuries and deaths. We hope this will be seriously considered.

Response: Posted speed limits on existing facilities such as I-90 will not change due to this project. Implementation of All Electronic tolling (AET) and elimination of the I-90 Toll Plaza will improve safety on I-90. Posted speed will be consistent to the east, west and within the limits of the interchange.

CO/WM-6: We hope DOT will include commitments as strong as the following one in its contracts: "The contractor will use best efforts to minimize noise during any overnight, weekend and holiday hours." (If DOT absolutely needs to have work proceed on Saturdays in order to satisfy its completion schedule, then change the word "weekend" to "Sunday.") What are nighttime hours?

Response: Noise and vibration associated with construction activities was assessed according to FTA and FHWA guidelines and local noise ordinances. This evaluation includes methods to minimize potential construction noise and vibration impact. The results of the construction noise and vibration assessment are presented in Section 5.11 and the Noise and Vibration Analysis. The City of Boston Noise Ordinance defines non-daytime hours as the hours between 6:00 PM and 7:00 AM daily and Sunday.

Nighttime hours will be defined more precisely when the contract specifications are prepared, but in general the hours are established based on off-peak traffic volumes and may extend from 9:00 pm to 6:00 am.

CO/WM-7: Timing of Noise Mitigation: We hope DOT will require its contractors to be pro-active in performing their noise-mitigation for predictable noise before the start of each stage of the Project, rather than waiting for complaints and community pressure to build, media to notice and administrative and political pressure to be exerted while the public continues to be subjected to excess noise. This pertains to daytime, as well as nighttime noise. Obviously, unanticipated noise from accidents or malfunctions can only be addressed when problems arise.

Response: Noise and vibration associated with construction activities was assessed according to FTA and FHWA guidelines and local noise ordinances. This evaluation includes methods to minimize potential construction noise and vibration impact. An important aspect to minimizing impact is to be predict potentially noisy activities and prepare for methods to mitigate noise. The results of the construction noise and vibration assessment are presented in Section 5.11 and Appendix H, Noise and Vibration Analysis.; Section 7.11 provides noise mitigation.

CO/WM-8: Longfellow Bridge work, as an example: Sen. Will Brownsberger: "We are also working closely with neighbors of the project and with MassDOT to control the local noise and disruption caused by the project."

Response: Comment noted.

CO/WM-9: Consider what other measures could and should be taken to reduce and mitigate construction/repair-related noise, as well as post-construction noise from normal use of the roadways.

Response: See response to CO/WM-7.

CO/WM-10: We're glad to learn that DOT will do traffic studies and planning focusing on avoiding or alleviating traffic problems at the 3 (?) bridges into and out of Cambridge.

Response: The traffic analysis discussed in Section 5.8 and Appendix C, Traffic Operations Study, includes the 3 Charles River bridges and 3 intersections along Memorial Drive.

CO/WM-11: Traffic Studies: DOT will undertake traffic studies and planning focusing on avoiding or alleviating traffic problems at the impacted bridges into and out of Cambridge.

Response: See response to comment CO/WM-10.

CO/WM-12: DOT/Cambridge CDD Meetings: DOT and Cambridge CDD personnel have been meeting and communicating. We hope and expect that they'll continue to do so to make sure our City has meaningful input into the Project, just as Boston personnel, businesses, business and community organizations, and institutions have had.

Response: See response to comment CCD-13.

David Read (DR)

DR-1: We hope the state will include some safe bike/ped facilities in the new design!

Response: Accommodations for safe bicycle and pedestrian access is mandated by a host of state and local design requirements. Refer to Section 5.7.

John Shetterly (JAS)

JAS-1: I live on Magazine Street in the Cambridgeport area of Cambridge. Neighbors of mine, Carol O'Hare and Walter McDonald, have submitted comments on the noise mitigation issues of the I-90 project. I fully support their comments and urge you to consider them carefully. On lower Magazine Street we can clearly hear road and rail noise across the River.

Response: MassDOT has expanded the noise Study Area to include noise sensitive locations in Cambridgeport including Magazine Beach, Morse Elementary School and residences north of Memorial Drive such as Granite Street, Florence Street, Tufts Street, Glenwood Avenue and the Riverside area north of River Street. The results of the noise impact assessment in Cambridgeport are presented in Section 5.11, noise mitigation in Section 7.11 and the detailed study provided in Appendix H, Noise and Vibration Analysis.

Frederick Maloney (FM)

FM-1: I am urging a low cost inclusion of improved mass transit access in planning for the reconfiguration of the Massachusetts Turnpike in Allston. This involves establishing inbound and outbound stop locations for existing MBTA express bus service now passing this point without stopping.

Response: The potential for express buses from the west to stop at the interchange West Station could be explored with the MBTA once West Station is constructed by 2040. In the first phase of the project, with no West Station, there are no safe places for express buses to stop to pick-up/discharge passengers on the eastbound or westbound ramp systems. The buses would have to exit the highway to get to possible stops on Cambridge Street or Cambridge Street South. This would have an obvious impact on express bus travel times and would have to be evaluated by MBTA.

FM-2: Presently the extensive system of express buses passing here operates to Copley and Downtown, with outer terminals in Brighton, Watertown, Newton and Waltham. With the current very expansive footprint of the roadways to allow for toll booths one would think that room is available for adjacent on and off stopping points outside the footprint that will be created here as the road routing is streamlined.

Response: See response to comment FM-1.

FM-3: An all-weather "skyway", akin to the one above Huntington Avenue, connecting the Prudential and Copley Place malls can connect the densely populated neighborhood, along with Cambridge-based local MBTA lines with the new stops from Cambridge Street.

Response: A skyway is outside of the Project scope.

FM-4: Straightening the Turnpike and eliminating the toll plaza will otherwise speed up traffic in this area so that the existing bus schedules running times can absorb slowing down, exiting the Turnpike to the stop areas and re-entering the Turnpike, in order to serve Allston people.

Response: See response to comment FM-1.

FM-5: Providing this rapid service to Allston offsets the negatives of having a noisy and polluting road - and a pending major construction site for the lengthy reconfiguration project - close to residents' houses. Many local people get little or no benefit or use of the Turnpike.

Response: Comment noted.

FM-6: While the Turnpike often has traffic jams at times, this part of Allston has almost always slow, and somewhat indirect, combination bus/subway linkage to Downtown Boston and all other points. As a lifetime Boston resident and frequent traveler to many old, large, cities, it has always pained me that the wide highways which cut wide swaths through city neighborhoods serve a regional transportation function, yet offer so little benefit, other than limited ramps, to the pre-existing densely populated old areas that endure the greatest negative impacts of these highways.

Response: With the implementation of All electronic tolling (AET), the "slow-downs" on the I-90 mainline at the Allston Interchange have been minimized. Congestion at the interchange is now primary related to ramp operations, which will be improved with the Preferred Urban Interchange 3K concept.

FM-7: To MBTA I recommend the following operational practices:

1. I would urge that initially all Route 501-505 and the 550 series lines make the stop in each direction during their hours of operation. Passenger surveys could later determine if some lines or trips stop only upon passenger requests on the buses.

Response: Addressing changes in existing operations of the various express bus routes are beyond the scope of this DEIR. As the commenter notes, the MBTA should be contacted directly with these suggestions.

FM-8: 2. Depending upon the level of utilization in Allston:

1. Starting Route 504 earlier than 6:20 AM
2. Starting Routes 502 and 503 earlier than at present
3. Adding an indefinite level of evening service to the outbound and inbound combined Copley/Downtown service presently provided by Route 553
4. Extending Saturday service hours on Route 504
5. If Allston ridership is strong, increasing Sat. service on Route 504
6. If utilized decently adding Sunday hours to Route 504

Response: See response to comment FM-7.

Jane Stolzman and Marc Hoffman (JS/MH)

JS/MH -1: Noise from the Pike is particularly disturbing to the neighborhoods, in Allston, in Cambridge, and on the Charles River. Particular care should be given to noise reduction, noise barriers, including transparent panels and noise absorbing materials.

Response: See response to comment EEA-80.

Arthur Strang (AS)

AS-1: First, a suspension bridge on Cambridge Street crossing the Pike and rail yard (possibly for pedestrians and bikes only) could be lower than a bridge supported from below. This, to reduce the grade and to better the mobility of bike and walk, and thereby also to reduce pollution.

Response: Provisions for bicycle and pedestrian access are discussed in Section 5.7.

AS-2: Second, any slowing or diversion of the buses on Cambridge Street (to the new rail station) harms the purpose of providing excellent bus service to and from the Red Line in Harvard Square. This would not support transit and multiple forms of mobility, especially for neighborhood commuters.

Response: For planning purposes, the CTPS model assumed minor re-routings of the MBTA Route 64 and 66 buses in the future. They were assumed to travel onto Cambridge Street South for stops near West Station, then continue on to Harvard Square via Stadium Way/North Harvard Street or to Central Square via Stadium Way/Cambridge Street.

AS-3: Third, a mobility study of The Inner Core, would better define the effects of faster traffic from the straightened pike and more (?) traffic to and from the Parkways at the Allston access to the Pike. This to evaluate equity in mobility and to reduce pollution.

Response: A regional "Inner Core" study is beyond the Project scope.

AS-4: Four, the mobility study above should include the option of connecting Allston directly to Kendall Square via rail, bike, and walk over the Charles River on the rail bridge, below the BU Bridge.

Response: Connections to Kendall Square are beyond the Project scope.

AS-5: Fifth, noise from the Pike is particularly disturbing to the neighborhoods, in Allston, in Cambridge, and on the Charles River. Particular care should be given to noise reduction, noise barriers, including transparent panels and noise absorbing materials.

Response: See response to EEA-80.

Laura Kershner (LK)

LK-1: Please incorporate into my response comments previously submitted to you by Carol O'Hare and Walter McDonald regarding noise mitigation on the above-referenced project. I read in the ENF that noise mitigation is recommended for the south side of the tracks. Does that mean that the north side, i.e. Cambridge, will not be getting any noise mitigation?

Response: See response to comment EEA-80.

LK-2: The fact that input on this project from Cambridge's residents and its City Council was very limited is shown by the fact that the ENF Circulation list did not include a single Cambridge Councilor or non-elected resident. Upon information and belief, out of approximately fifty members on the Task force, there may have been one Cambridge City employee and possibly one resident, though she may have been there representing a Boston organization. However, Harvard, MIT and BU all had representatives on the Task Force.

Response: The City of Cambridge has three representatives on the Task Force: Henrietta Davis, a resident of Cambridgeport and former Mayor, and two members of the City planning/transportation staff, Bill Deignan and Susanne Rasmussen. Project staff have met with Cambridge planning staff on several occasions to answer their specific questions regarding the Project.

Project staff members have appeared before the Cambridge City Council once and before the Cambridgeport Neighborhood Association three times with documentation of all three sessions made available via the Project website. Public meetings for the Project have been advertised in the Cambridge Chronicle, a daily newspaper serving Cambridge, and the City of Cambridge has assisted in this outreach through municipal social media channels.

LK-3: The reality is that Cambridge is as impacted by this project as Allston. One of my biggest concerns is that the Grand Junction Railway will be turned into a major train track, creating car traffic gridlock throughout eastern Cambridge, with at least six on grade railroad crossings within a mile of my house. I am handicapped and can't bike or walk, but have to drive. The traffic in the last few years has become a nightmare. Sometimes it takes me twenty minutes to go the one block to get onto Brookline Street so I can leave my house.

Response: While the proposed West Station is being designed so as to not preclude future use of the GJR ROW for passenger rail service, the implementation of passenger rail services along the GJR through Cambridge is outside the scope of this Project.

LK-4: What is going to be done about traffic mitigation? The estimates of traffic increases in the ENF were not believable. The report states there will only be 3,200 more cars on Storrow Drive twenty years from now. Memorial Drive was not even mentioned. Does that mean that in order to only have another 3,200 cars on Storrow, all the other cars will be diverted to Memorial Drive? In addition, transportation demand management was only looked at for Allston, not for Cambridge. Isn't this supposed to be a regional solution? Or are we going to be short-sighted and be like the Big Dig, bury the highways and don't worry whether the traffic gets better or not?7

Response: The traffic analysis includes 3 intersections along Memorial Drive. See Section 5.8.2 and Appendix C, Traffic Operations Study.

LK-5: The ENF intimated that there will be additional land development. Where are the cars going to go? I do not believe that everyone will walk, bike, or ride the T and there will be no new cars added to the streets. This is happening while both Cambridge and Boston are taking away handicapped car spaces and putting bike racks in instead. What are handicapped people supposed to do? I am not opposed to encouraging walking and biking, but there has to be recognition that not everyone can do that. People with children may need to drive as well.

Response: Additional land development is not part of the interchange Project. The intent of the project is to not preclude landowners from future development rights which they currently maintain. Future development plans by the owner will be subject to similar analysis and public review; however, the traffic analysis does include land development assumptions for the BPY that may occur by 2040. Refer to Sections 5.2 and 5.8.2.

LK-6: The ENF also discussed West Station. It appears that it will be located just across the river from Cambridgeport, though with no access to it for Cantabridgians. This will add to the noise factor for Cambridge, as well as if they locate the repair facilities there as well. It seems as though the station should be located in the heart of Allston, where people can access it easily. Locating the station where it is now designed, which is high up, will impact the view from Cambridge, will increase the noise, and will take up a lot of land in order to make it accessible to the handicapped.

Response: Multiple shared use path alternatives provide pedestrian and bicycle access to and from the south side of West Station. This includes connections from Malvern Street and Babcock Street which are all logical connection points as they each are continuations of the existing streets. Refer to Section 5.7 and Section 5.11 for access and noise impacts, respectively.

LK-7: I saw in the ENF that there was a "No Build" alternative. Instead of having a new, expensive "Big Dig" maybe a "no build" or smaller version could be considered that wouldn't impact Cambridge and Allston so negatively. Maybe we could put the old "A" Green line back in place.

Response: The No Build Alternative is terminology used in environmental documentation alternatives analyses, where it serves as the benchmark against which the impacts of other alternatives are compared. Specific to this Project, the 2040 No Build alternative is included in the analyses presented in Chapter 5. The No Build alternative includes rehabilitation of the I-90 viaduct. The viaduct is in poor condition and even if nothing else is done within the project, the existing structure will need to be extensively rehabilitated. Chapter 5 includes a No Build Alternative for each impact assessment topic.

LK-8: Recently, there was a move to have the Worcester commuter line go to North Station via the Grand Junction Railway. That proposal was soundly defeated by the residents of Cambridge and the City Council. This ENF is asking for the same proposal, only disguised by asking to build additional tracks. Maybe we should learn from history.

Response: Comment noted.

Olivia Fiske (OF)

OF-1: I am delighted to understand that there will be a new commuter rail station built during the Allston I-90 interchange redesign, but I want to encourage the redevelopment of the Grand Junction Path as part of this project. Currently there are little used but important rail tracks running across the river and across the city. The new West Station could be an important transportation hub if people could travel from there to North Station. I would love to see public transportation along those tracks, but also feel it is very important to develop a pedestrian and bicycle path along the same right of way. The state should take the opportunity to improve or repurpose the existing rail bridge that connects Allston to Cambridge. This is an incredible opportunity to restore this artery for public use. I want to encourage MassDOT to include the Grand Junction Path in the I-90 reconstruction project.

Response: The GJR Bridge over the Charles River is beyond the Project scope.

OF-2: I am very concerned about whether or not the Grand Junction Path will be accommodated in this project. I feel it is very important that MassDOT builds a shared-use pedestrian and bicycle path from Allston, over the Grand Junction Railroad bridge, and into Cambridge. The state should take the opportunity to improve or re-purpose the existing rail bridge that connects Allston to Cambridge. This right of way could connect Allston (West Station) to North Station, which is incredibly difficult to get to without schlepping to South Station, and walking or taking several trains! This is an incredible opportunity to restore this artery.

Response: The GJR Bridge over the Charles River is beyond the Project scope.

Cathie Zusy (CZ)

CZ-1: Please make the new I-90 Interchange bicycle and pedestrian friendly and add a parkland buffer along the Charles River. We need to plant trees there—to absorb the sound from all the traffic. Cambridge's 2nd largest park is just across the way and we need a view of something other than roads and traffic, too!

Response: Refer to Sections 5.4 and 5.7 for Project open space and pedestrian bicycle connections.

Anthony Pangaro (AP)

AP-1: The redesign and relocation of the I-90 Interchange is essential to the development of this barren and abandoned railroad yard. I urge you to insure that the roadway and transit alignments are considered as part and parcel of the remaining environmental work to be done. These details should be included in any going forward design and execution of the state's portions of the project.

Response: Roadway and transit alignments through the rail yard are evaluated in Chapter 5.

AP-2: Merely moving I-90 to a better location will not be a sufficient action on the part of the Proponent. Rather, mitigating the potentially damaging impacts of the new I-90 should be seen as part of the job. Provisions can easily be made now (and will be difficult or impossible later) for "development friendly" line-and-grade and cross sections for roadways and transit.

Response: Mitigation measures are provided in Chapter 7.

AP-3: In addition, please insure that construction cross-sections include decking over the roadway and tracks so that sites can be created for development over or adjacent to these transportation facilities.

Response: See response to comment EEA-7.

AP-4: Future development foundation locations should also be planned now as part of the design work for the roadways and transit lines, with retaining wall structures and decking included as part of the design of the proposed project. Decking is necessary in order to allow for practical economic use of air and side rights.

Response: See responses to FAQ Decking/Air Rights and EEA-7, and also Section 5.2.

Marilyn Wellons (MW)

MW-1a/b: The scope of the project as outlined strikes me, a Cambridge resident, as understandable but flawed. Despite City of Cambridge representation on the Advisory Committee, limiting analysis to the south side of the Charles River is a significant error.

Response: Three intersections along Memorial Drive in Cambridge were included in the traffic analyses and discussed in Sections 4.8.1, 5.8.2 and Appendix C Traffic Operations Study. Transportation and other Project impacts are presented in Chapter 5.

MW-2: While Cambridge CDD's letter weighs in on noise pollution, it's not clear to me whether the project's mitigation will protect against noise that crosses the river to neighborhoods here.

Response: MassDOT has expanded the noise Study Area to include noise sensitive locations in Cambridgeport including Magazine Beach, Morse Elementary School and residences north of Memorial Drive such as Granite Street, Florence Street, Tufts Street, Glenwood Avenue and the Riverside area north of River Street. The results of the noise impact assessment in Cambridgeport are presented in Section 5.11 and Appendix H, Noise and Vibration Analysis. Construction term noise mitigation measures will be implemented and are described in Section 7.11.

MW-3: Finally, I believe that MEPA and Mass DOT know that the "multi-use path" is not a panacea for transportation in the region, although it often seems advanced as one.

Response: Providing safe and efficient bicycle/pedestrian facilities through the Project Area that connects the Allston neighborhoods to the Charles River Reservation is an important Project/community goal, and is part of the Urban Interchange Preferred Alternative.

Galen Mook (GM)

GM-1: As a Task Force member and resident, I would like to request the following: The traffic on Linden St, Cambridge St, and Harvard Ave be taken into strong consideration when modeling traffic patterns, with all due effort to reduce the amount of commercial and I-90 traffic cutting through Allston Village (Harvard Ave and Linden St).

Response: Traffic modeling and analyses include these streets as presented in Sections 4.8.2 and 5.8.2, and Appendix C, Traffic Operations Study.

GM-2: A new north/south connection be studied to connect from the North side of the Pike to Comm Ave by Packard's corner, which would alleviate much of the traffic congestion on Harvard Ave and Linden St. Potential connections could be along Malvern St, Alcorn St, or Babcock St over the pike and rail yard to Stadium Way.

Response: MassDOT has studied the benefits/impacts of providing a new roadway connection between Commonwealth Avenue and Cambridge Street. Two options were evaluated: (1) a connection open to all traffic; and (2) a connection limited to buses only. Although construction of this connection is not included as part of the Project, the Project design will not preclude this roadway connection from being implemented by others in the future. A summary of the evaluation can be found in Section 5.8.2.4 Detailed results of this evaluation are provided in Appendix C, Traffic Operations Study.

GM-3: A new I-90 on/off-ramp be studied further eastbound on the pike, outside of this project scope, to connect to Bowker/Beacon St, which would be used for traffic heading to Longwood/Fenway/Downtown, and potentially alleviate traffic that uses the Allston exit and then onto SFR/Storrow Drive.

Response: See response to comment Allston-61. Serving the Kenmore Square and the Longwood Medical Center with additional interstate ramps beyond the Project limits is beyond the scope of the Project

GM-4: The north/south bike and pedestrian connections across the project area must not be only routed through the transit station (West Station), but rather be a convenient and direct connection from Comm Ave to the multi-use path. This may require multiple pedestrian/bike connections over the project area.

Response: Refer to Sections 3.1, 5.7 and 5.9.

GM-5: Prioritize the environmental impacts of moving Soldier's Field Road and opening up the riverfront at the beginning of the project, and have this be fully funded and scheduled before any DCR parkland be taken for construction staging. We must not have to wait a decade for improvements to the riverfront if the Pike will be built first.

Response: Under all three Throat Area Variations, there will be a significant opportunity to create open space with the expansion of the parklands along the Charles River, and improved access from the surrounding neighborhoods along the north side of Cambridge Street South. See Sections 5.4 and 5.7. Construction staging of SFR and the creation of open space will be determined based on the selection of the Throat Area Variation and the timing of the I-90 demolition to allow for construction of these elements. See Section 5.22 for conceptual staging for each Throat Area Variation.

GM-6: Decking should be considered and constructed over the rail yard to mitigate pollution, noise & disruption to the neighborhood of Pratt St, Ashford St, Wadsworth St.

Response: Decking is linked with future air rights development by the property owner. The Project does not preclude future decking by others. See response to FAQ Decking/Air Rights and EEA-7. Also see Section 5.2 for land use impacts.

Peter Klinefelter (PK)

PK-1: I am writing in support of a new pedestrian / bicycle bridge that would link a new "Allston Esplanade" with Magazine Beach Park in Cambridgeport across the river. The idea has appeared in sketches by both teams that recently presented concepts in the BSA design study for the project. It is also supported in spirit by the proposals by MassDOT in the ENF to create pedestrian / bicycle links to surrounding neighborhoods.

Response: A new pedestrian/bicycle bridge over the Charles River is beyond the scope of this Project.

PK-2: If the new parkland is created or allocated as part of the project then a direct link between the two adjacent riverside parks would further energize and enhance the pedestrian experience in this section of the river, bringing people into more direct contact with the river and compounding the benefits of the individual parks. The bridge should be located so as to conveniently connect between proposed pedestrian/bicycle pathways from neighborhoods in Allston / Brighton / Brookline and along the Charles through the parks to existing pedestrian / bicycle pathways from the Cambridgeport neighborhood. This bridge could be an icon and, with the two parks, animate and identify the presently undistinguished center of the most actively used part of the Charles between the Eliot and Longfellow bridges.

Response: A new bridge over the Charles River is beyond the scope of this Project.

The Project expands parklands along the Charles River. It greatly improves accessibility to that parkland through the creation of an at-grade pedestrian/bicycle crossing from the sidewalk and cycle track on the north side of Cambridge Street South, which connects to neighborhoods to the north and to the south of the interchange area with sidewalks and protected bike lanes. Access to River Street – to Cambridge – for pedestrians and bicyclists is improved through a separated bike lane, sidewalk and plantings where the existing vehicular ramp to River Street exists today. The Project is not proposing a new bridge over the Charles River. Refer to Section 5.7.

PK-3: The proposed connection over the Grand Junction bridge, while fulfilling a functional role of linking across the river and on to Kendall Sq, would not encourage easy cross-communication between the parks and would not provide the same focal quality. That connection would also be sharing a bridge with a live rail line, not an ideal situation for enhancing the park experience along the river. I strongly believe that this feature should be integrated into the overall planning of the project if a new "Allston Esplanade" in included, which I also strongly support.

Response: The GJR Bridge over the Charles River is beyond the Project scope.

Harry Mattison and Alana Olsen (HM/AO)

HM/AO-1: Please require MassDOT to study replacing the Grand Junction Rail Bridge with a new structure for two rail tracks, cyclists, and pedestrians that would be assembled in the currently unused rail yard and transported by barge to the bridge location. MassDOT should analyze other construction/replacement strategies of its choosing and compare/contrast them with this technique.

Response: Replacing the GJR bridge over the Charles River is beyond the scope of this Project. Also, see Response to FAQ Pedestrian and Bicycle 1.

HM/AO-2: Please require MassDOT to study the following to minimize the impact of these activities and create the opportunity for a suitable buffer including decking over the tracks and tree planting, construction of an earthen berm, and sound barrier walls between the tracks/deck and the residential abutters.

- Relocating the active rail line further from Pratt and Wadsworth Street homes.
- Lowering the elevation of the active rail and storage tracks and removing all contaminated soil.

Response: See response to FAQ Future Development/Decking/Utilities and Sections 5.20 and 7.20 for material handling.

HM/AO-3: Please require MassDOT to study how new roads to be built in the project area can be extended to meet the existing Malvern, Alcorn, and/or Babcock Streets to provide bus and private automobile drivers with more efficient and less wasteful routes.

Response: An evaluation of this roadway connection is provided in Section 5.8.2.4, but construction of it is not included as part of the proposed project. The Project will, however, be designed so as not to preclude this connection being made in the future should others wish to pursue it. Also see Appendix C Traffic Operations Study. Pedestrian and bicycle access to West Station from these roads is described in Section 5.3.5.

HM/AO-4: Please require MassDOT to study the construction of new Mass Pike exits at or near the Beacon St Overpass.

Response: Alterations to the interstate beyond the Project limits are beyond the scope of the Project; see response to comment MAPC-2.

HM/AO-5: Please require MassDOT to study how existing or new bus routes will provide service to West Station.

Response: See response to comment Allston-34.

HM/AO-6: Please require MassDOT to include the construction East Drive from Western Ave to Cambridge Street and Stadium Way from North Harvard St to Cambridge Street as part of the I-90 Interchange Improvement Project.

Response: See response to comment BTD/BRA-16.

HM/AO-7a: Please require MassDOT to include in its DEIR:

1. The option described above, which was presented to the Task Force and was not included in the ENF. The problem description, and the option presented to the Task Force should be described and included in an alternatives analysis to explore whether a better option is feasible. The sequence of construction should include the reconstruction of a two-track Grand Junction bridge both where it crosses over the Charles River the separate structure that crosses over Soldiers Field Road. At least one option should replace the Grand Junction bridge at the initial stage, providing the upstream track, and the ramp structure needed to come to ground and pass under the viaduct so that the turnpike viaduct reconstruction can proceed without disrupting MBTA rail access to Somerville. As mitigation for the unavoidable construction disruption of the River parkland, the Grand Junction bridge reconstruction must be accompanied by a pedestrian and bicycle bridge connecting parkland in Cambridge and Boston. This entire component should occur in the first phase of construction to maintain and enhance pedestrian and bicycle connectivity and functionality throughout the entire construction process.

Response: Reconstruction of the Grand Junction bridge over the Charles River is beyond the scope of the project. Appendix M, Evolution of Soldiers Field Road Relocation under Viaduct Concept, provides an alternatives analysis that addresses the feasibility of the I-90 viaduct over a realigned SFR eastbound.

HM/AO-7b: 2. The same alternative presented by MassDOT and described in #1 with a provision that the two lane additional viaduct in the DCR land be treated as temporary structure to be removed at the end of the staging period. This would substantially reduce the adverse permanent impact and be superior from a section 4f point of view. The relocation of Soldiers Field Road away from the edge of the River could take place at the end of the construction process to provide the same widening of the River parkland without the complexity of locating Soldiers Field road under the viaduct. This improvement in the River parkland would serve to mitigate the temporary intrusion into parkland. Moreover, if it is recognized that MassDOT is currently operating this section of the Mass Pike with 3 lanes each way (to enable construction related to the Commonwealth Ave overpass) and the performance of the traffic is no worse than at several other points in the road, the construction could be expedited by letting the northerly 6 lanes operate as a two way temporary viaduct while removing the southerly 4 lanes, allowing much more generous construction zones. This approach would have the added benefit of locating the new rail and viaduct at somewhat lower profiles, both to recognize the likely need to remove contaminated earth, and the desirability of a somewhat lower profile. MEPA should require that MassDOT develop this alternative as a means to avoid all or most permanent adverse impact, as required by law. This approach would also have less adverse impact on traffic during construction, and therefore result in less spillover traffic onto neighborhood streets.

Response: See subsections under Section 3.3 “Throat Area Variations” for a discussion of viaduct cross section widths and their implications regarding AASHTO design criteria, design exceptions, safety, operational and maintenance benefits and deficiencies, and at-grade comparisons. Discussion includes development of the 3K-HV (HV3) alternative which requires temporary viaduct within DCR land that would be removed upon viaduct completion to minimize impacts to DCR land.

HM/AO-7c: 3. An alternative with the westbound lanes of the Turnpike permanently at grade to reduce impacts and mitigate the apparently inevitable temporary construction period use of the DCR land.

Response: 3K-AMP and 3K-ABC Throat Variations provide eastbound and westbound lanes permanently at-grade/partially below grade. An alternative with only westbound lanes permanently at-grade is not feasible due to the need for the GJR Bridge to pass over I-90 which would conflict with the elevated eastbound lanes.

HM/AO-7d: 4. An alternative that utilizes the space under the existing viaduct to accommodate one of the temporary detours, and thereby avoid even construction period adverse impact on the DCR land.

Response: Available space below the viaduct will be used for temporary Worcester Mainline alignments during construction staging. Temporary and permanent at-grade/partially below grade I-90 alignments will be constructed within the limits of the existing viaduct upon completion of viaduct demolition. See Section 5.22.

HM/AO-8: Please require MassDOT to study the potential for both Widett Circle and the 4-track space between Litchfield St. and Harvard Ave to be used for rail storage and reduce the acreage in the project area proposed for rail storage.

Response: See response to comment Allston-65.

HM/AO-9: Please require MassDOT to develop a unified plan that incorporates:

1. Allowing both inbound and outbound drivers on Soldiers Field Road to exit onto South Cambridge Street or a similar road south of the DoubleTree Hotel.
2. Removing at least one lane of the Soldiers Field Road outbound frontage road exit that could become redundant if #1 is implemented.
3. Pedestrian and bicycle access from the People’s Pike bike/ped path in the project area over Soldiers Field Road to the Charles River parkland.
4. A relocation of the Soldiers Field Road away from the River to create a generous riverfront crescent park.
5. Construction staging implications that include the reconstruction of Cambridge Street and Mass Pike viaduct.
6. Houghton Chemical freight access.
7. Access to the DoubleTree Hotel.

Responses: Preferred Interchange Concept 3K includes:

1. New on/off-ramps to SFR at Cambridge Street South will be provided
2. SFR WB off-ramp to Cambridge Street will be eliminated
3. Ped/bike connection to PDW Path provided at grade over depressed SFR mainline
4. SFR will be relocated to the west resulting in additional open space
5. Construction phasing for Cambridge Street and the Viaduct are discussed in Section 5.22.
6. Rail access to Houghton Chemical will be eliminated
7. Access/egress for the Doubletree Hotel will be provided

Also refer to Sections 3.1, 3.3 and 5.8.1.

HM/AO-10: West Station must have extensive connections to maximize its role in tripling non-auto mode share by 2030 as per MassDOT policy. This requirement is necessary for both environmental purposes and also for economic development objectives. I-90 is operating beyond its practical capacity and is dysfunctional at several key junctures, including the I-95 interchange, Newton Corner exits, South Station approaches, and Ted Williams Tunnel. The ability to serve the growing job centers in Downtown Boston, the South Boston Innovation District, Kendall Square, Longwood, and eventually the new node that will emerge in Allston is totally dependent on installing the appropriate signal systems and track configurations and purchasing adequate Commuter Rail and DMU rolling stock to support dramatic increases in rail passenger capacity. The Task Force has been pleased with the commitment to build a 4 track two-platform West Station, but to maximize the value of this investment it is essential that West Station be fed by two tracks connecting to South Station and two tracks connecting to North Station via Kendall. Public discussion of High Speed rail to the west connecting to Worcester, Springfield, Hartford and New York suggests the potential need for more capacity in the track systems, so there must be no ambiguity in the need for two track connectivity to both North and South Station. MEPA should require this as a necessary foundation to support MassDOT’s GreenDOT policy.

Response: West Station is designed to include 2 platforms and 4 tracks to maintain connectivity to the Worcester Main Line for passenger rail services to South Station and to not preclude future use of the GJR ROW for passenger rail service connections between the Worcester Main Line and North Station. The analysis of potential passenger rail services to North Station is outside the scope of this Project.

HM/AO-11: The Charles River parkland is particularly deficient in the Allston area with the Dr. Paul Dudley White pathway constrained to 10 feet and less in many locations. It is encouraging that MassDOT, outside of the Allston Interchange Improvement Project, has agreed to include pedestrian and bike underpasses in the Anderson, River Street, and Western Ave Bridges and ask that MEPA include that commitment as an essential feature of the Allston Interchange Project to mitigate construction impacts and support MassDOT mode-shift goals in the host neighborhood of this project.

Response: The street network will include key east/west pedestrian and bicycle connections along Cambridge Street South, accommodating a direct link between North Allston to the Charles River Reservation/PDW Path. See Section 5.7. Improvements at the Anderson, River Street, and Western Ave bridges are outside of the Project scope.

HM/AO-12: There is a once in a lifetime opportunity to achieve a much more generous parkland along the Charles River, with pedestrian/bike connections connecting Cambridge and Boston Esplanade, a new Crescent Park along the Charles, and a People’s Pike connection into and through the new neighborhood that will rise in the project area. Contributing to this opportunity, and not constraining it, should be designated by MEPA as a core element of the purpose and need of the project and a primary evaluation criterion.

Response: . Refer to Section 5.4 for open space opportunities associated with the three Throat Area Variations and Section 5.7 for Bicycle and Pedestrian connections.

HM/AO-13: The opportunity for an entire new neighborhood/economic development district replacing the current Turnpike Interchange is one of the very exciting aspects of the Allston Interchange project which generates strong public interest, has been clear at Task Force meetings, and should be included in the Purpose and Need and Evaluation Criteria.

Response: The urban interchange Project will create developable lots to the north of the highway. The creation of these lots will change the land use of this area from highway to institutional, commercial and residential uses, consistent with the mix of uses as described in Harvard University’s Institutional Master Plan (IMP). At the regional level, the Project will result in expanded economic activity and user transportation benefits See Section 5.2. The Purpose and Need are relevant to highway operations and not economic development.

HM/AO-14: The future economic development opportunity in the project area should be strengthened by including in the construction of the highway and rail yard a suitable decking over these transportation elements and minimizing and mitigating the environmental impacts of the rail and highway transportation facilities. MEPA should identify this as a core element in the purpose and need for the Allston interchange and a primary criterion for evaluation of alternatives.

Response: See responses to FAQ Future Development and comment EEA-7, and also Section 5.2.

HM/AO-15: The standard I-90 configuration from I-95 to South Station is 6 lanes, plus auxiliary intermittent lanes at key spots and 4 lanes in the Ted Williams Tunnel. It is essential that the Allston Interchange provide this basic 6- lane configuration. It may be useful for auxiliary lane capacity at key spots, but this is not so high a priority as the need for expanded passenger rail capacity identified in #1.

Response: There is no “standard” cross-section on I-90 between I-95 and I-93. In fact, more of that highway segment (5.5 miles of the 10.5 miles) has an 8 lane cross-section vs. a 6 lane cross-section. Variation 3K-HV will maintain the current 8-lane cross-sections on I-90 east and west of the interchange, but will drop a lane and provide for a 6-lane cross-section through the interchange area (i.e., the segment of the highway between the Allston eastbound and westbound off- and on-ramps.

Brian Conway (BC)

BC-1: As a 30 year resident of Cambridgeport and frequent user of Magazine Beach Park, our family is in strong agreement with Carol O’Hare’s and Walter McDonald’s views on the need for noise mitigation measures for the upcoming MassPike Highway realignment & reconstruction near the Allston/Brighton tolls.

Response: See response to comment EEA-80.

BC-2: Our views would be even more oriented towards a more permanent noise mitigation solution, such as permanent sound barriers, that we strongly believe should be integrated into the redesign & realignment of the highway.

Response: Provisions for noise mitigation are integral to the project design for noise related impacts associated with the Project. Refer to Section 5.11 and 7.11 for noise impacts and mitigation, respectively.

BC-3: Because of the elevated nature of the current highway, the noise generated transmits and penetrates far deeper into our neighborhood that a normal surface roadway. The near constant highway rumble, at all hours, adversely affects our neighborhood. It also decreases our use and enjoyment of the Charles River and the 15 acre, Magazine Beach Park, the second largest park & open space in Cambridge.

Response: The existing background noise will not change in future conditions. The Project will mitigate for any increase in noise levels above existing conditions. Refer to Sections 5.11 and 7.11 and also see response to comment EEA-80.

John Sanzone (JS)

JS-1: The City of Cambridge submitted comments that ask of the project items that ought to be included as a baseline: great river access for the communities, maximized parkland, robust transit infrastructure, and especially, fully-designed and high-volume infrastructure for walking and biking to, from, and through the site. It is imperative that the project design fully design—with input from the community—robust and extensive walking and biking infrastructure, just as the interstate designs have been robust and extensively thought-out. The Grand Junction Path is moving ahead in Cambridge and at its connection point to the Somerville Community Path. A multi-use Path through the Allston site to Cambridge Street and to BU can link with the Grand Junction Path under the BU Bridge and be a game-changer for transportation and healthy, human-scale living for the entire region.

Response: See response to FAQ Pedestrian and Bicycle and Opens Space 1 and 2 and Section 5.7.

Judith Motzkin (JM)

JM-1: Please be sure to create permanent solutions to noise from the new Allston interchange are included in the plan from the start. This is one of many issues of concern for those of us who live directly across the water.

Response: See response to comment EEA-80.

CITIZEN FORM LETTER RESPONSES (CITIZEN)

Note all letters contained the same comments as listed below:

Karen Smith
Michael Monroe
Jennifer Lee Mills
James Fogel *
Karen DiFranza
Scott Devlin
Christopher Ott
Christopher Conroy
Chris Dippel
Stephan Jacobs
Michael Immel
Debra Iles
Yurij Roman Lojko
Sarah MacDonald
Melissa Mattison
Carol Schauer
Andreae Downs*
Susan Donaldson
Pauline Lim
Paul Fein
Deborah Stein Sharpe
Liam Sullivan
Erica Reisman
Patricia Maher
Megan Ramey
Emily Marvosh
Nicole Manseau
Eric Anderson
Henry Lieberman
Patricia Hogan
Douglas Ely
Alisha Fowler
Meg Muckenhoupt
Andrea Yakovakis
Maria Simoneau
Theresa Smith
Andrea Love
Colin Durrant
Matthew Wilkinson
Andrew Farnitano
Miles Grant
Dorothy Fennell
Jane Hayes
Xander Miller
Jane McHale
Tom Parks
Xavid Pretzer
Jennifer Uhrhane
Alexander Calhoun
Molly Reinero
Matthew Welch
Lauren Greenberg
Jeremy Hanson
Bruce Lederer
John and Marilyn MacDougall
Alex Epstein
Dimitri Kountourogianni
John Pelletier
Ania Wieckowski
Erica Mattison
Julia Hansen
Matthew Soule
Matt Lawlor
Todd Consentino
Kathryn Fahey
Allie Sherwood
Stephanie Danielson
Ari Ofsevit
Jeffery Orlin*
Nina Garfinkle
Robert and Paula Alexander*
Caryn Oppenheim
Tom Lamar*
Joshua Bellin
Joyce Radnor
David Kuss
Arlene Mattison
Ian Hutchinson
Jason Nelson
Franklin King IV
Priscilla Anderson*
John Eskew*
Kate Kelly
Elizabeth Egan
Rita Vaidya*

*Responses to unique comments made by the commenter are provided in previous individual responses.

Citizen-1: I urge you to require MassDOT study the following: Acres of new parkland along the Charles River called the “Allston Esplanade.”

Response: See response to Open Space FAQ 1 and 2 and Section 5.4.

Citizen-2: A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.

Response: A multi-use path connection across the Grand Junction Rail Bridge to Cambridge is beyond the scope of the Project. See Section 5.7 for more information on pedestrian and bicycle access.

Citizen-3: A new “West Station” transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.

Response: The project includes a new West Station that will provide a “neighborhood” style Commuter Rail station with bus service connections. Developing alternatives for rapid transit services to downtown and Kendall Square is beyond the scope of the Project, however, the Project will not preclude implementation of rapid transit services or connections to Kendall Square via the Grand Junction Railroad (GJR) in the future.

Citizen-4: A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.

Response: See responses to Future Development FAQ and EEA-7 and also Section 5.2.

Citizen-5: Existing roads extended to connect Commonwealth Avenue and Cambridge Street to reduce cut-through traffic through the Harvard Avenue and Linden Street business district and neighborhood.

Response: An evaluation of this roadway connection is provided in the Section 5.8.2.4, but construction of it is not included as part of the Project. The Project will, however, be designed so as not to preclude this connection being made in the future should others wish to pursue it. Also see Appendix C, Traffic Operations Study.

Citizen-6: New Mass Pike on & off-ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston’s streets and Storrow Drive.

Response: Evaluation of possible new ramps on I-90 at Park Drive or Beacon Street are beyond the scope of the Project.

9.2 Public Involvement

9.2.1 Overview

Begun in the early spring of 2014, the goal of the I-90 Allston Interchange Improvement Project is to reconfigure the Allston Interchange on the Massachusetts Turnpike – inclusive of Exits 16, 17 and 18 – and to replace the aging, structurally deficient Allston viaduct which carries I-90 over the Worcester/Framingham Commuter Rail line between Boston University (BU) and Soldiers Field Road (SFR). The Project has since grown to include West Station, a new stop on the Worcester/Framingham line to serve the Allston community, and associated support facilities. The Project also proposes a suite of pedestrian and cycling amenities designed to increase mobility for non-motorized users across the Beacon Park Yard site (BPY), Allston and the Paul Dudley White Bike Path (PDW Path) along the Charles River. These principally include, but are not limited to: a bicycle/pedestrian connection across BPY from Commonwealth Avenue to Cambridge Street; application of MassDOT Complete Streets guidelines, including protected intersections, to the new roadways to be built to transition between I-90 and city streets; and a new, at-grade and intersection-free bicycle/pedestrian connection to the PDW Path. The Project also includes approximately 4 acres of new open space along the Charles River, depending on variants for the Throat Area discussed at length elsewhere in this document. All of these elements can be traced to the Project's conceptual design phase, in direction if not in form, and all are consistent with direction provided to the Project Team by the Allston community, going back to the beginning of the Project.

Members of the Project Team and the Task Force discuss the Project during the March 30, 2016 site walk, standing on the corner of Ashford Street and Babcock Street looking north towards Beacon Park Yard

Public involvement, outreach and comment have shaped the Project between each major milestone to date, leading from the filing of one key environmental document and the publication of one study through to this DEIR. The filing of the Environmental Notification Form (ENF) in the fourth quarter of 2014 firmly set the Project on the path of recasting the current, suburban-style interchange into an urban form. The concept advanced in that document, known as '3J', was developed to allow the Project to fulfill the goal of being a less-intrusive neighbor to the Allston community, and to enable it to support multimodal connections as well as those by vehicle. Out of public comment on the ENF, Concept 3J evolved into Concept 3K, which was studied in the "Allston I-90 Placemaking Study" conducted by the Boston Planning and Development Agency (BPDA) between 2015 and 2016. Public comment on that work, paired with ongoing refinement within MassDOT, evolved the 3K concept into 3K series described in this DEIR.

Outreach for the current DEIR period began in June 2015, with a Public Information Meeting at the Jackson-Mann Community Center and the reconstitution of the Task Force, followed by an initial Task Force meeting the following month. The DEIR-phase Task Force includes nearly all of the original members from the ENF phase, with a handful of exceptions, mainly to accommodate changes in representation within the included organizations. The Task Force is composed of local residents and activists, members of the Allston business community, and representatives of key institutional stakeholders such as Boston and Harvard Universities. A listing of Task Force members is provided in Table 9.2-1 at the end of this Chapter.

From mid-2015, cognizant of the level of complexity associated with advancing the concept to the DEIR stage, and of the level of interest in Allston and abutting communities, MassDOT embarked on an extraordinary outreach program, maintaining a Project website and stakeholder list, and holding over the course of roughly two years:

- 22 meetings with the Task Force, including sessions with the BPDA to discuss the Placemaking Study;
- 7 Public Information Meetings, including two in Cambridge and two in Brookline; and
- One site walk at the request of Task Force membership.
- In addition to meetings organized by MassDOT, members of the project team appeared at:
- Two meetings organized either fully or in part by Task Force membership and advocates interested in the Project; and
- One City of Boston organized open house in Allston. (This open house covered multiple topics of interest to Allston residents.)

9.2.2 Public Comment Impact on Concept 3K-Refined

Given the volume of public interaction, a strictly chronological accounting of meetings and outcomes from each would run at great length. It would also make for difficult reading, given the parallel and sometimes overlapping tracks of meetings with the Task Force and MassDOT, the Task Force, MassDOT and BPDA, and MassDOT and the general public. For those interested, all meeting minutes generated to document the public involvement process are provided on MassDOT's website: http://www.massdot.state.ma.us/highway/HighlightedProjects/AllstonI90InterchangeImprovementProject/Documents.aspx.

Here, in order to provide a useful structure and assist the reader in understanding both the extensive public comment on this Project and its impact on the evolving design, input is grouped and summarized below by major elements and themes of discussion.

The Throat Area

While there is broad, general consensus that the current Allston Interchange should be replaced with an urban-style interchange, and that the current I-90 Allston viaduct is structurally deficient and must be replaced, there is significant public interest in the form that replacement should take.

During the summer of 2015, Task Force members advanced two concepts, discussed in detail elsewhere this document, to replace the viaduct either with an at-grade solution (3K-ABC)—featuring SFR, I-90, and the railroad lines all side-by-side—or a railroad viaduct solution (3K-AMP), which places the Grand Junction Line above a I-90 running at-grade. Initially, the rationale behind advancing the study of these options was presented as allowing the removal or reduction of viaduct structure in order to reduce costs and potentially free up funds for other community desires. As the concepts have evolved and collaboration between the Task Force and the Project Team has continued, the Project Team has made clear that funds 'saved' by these variations would not necessarily remain in Allston and would more likely be dedicated to other projects within the MassDOT system. At the same time, the proponents of these plans have further refined their support, arguing that there are further benefits to the at-grade and rail-viaduct variations, including an opportunity to deck over I-90, thereby hiding it from view, creating new public space and providing increased or improved connections to the river. Proponents of both options have also suggested that their approaches offer opportunities to reduce noise emitted by I-90.

Significant discussion of these options has taken place in the Task Force over the course of several meetings and workshops, both in daytime and evening sessions as requested by members of the Task Force. Much of this discussion has focused on establishing the width of various sections of the throat and of elements that need to be placed within it, including rail infrastructure and vehicular travel lanes. These issues rose to the fore because, depending on what widths are used and which variation is under discussion, transportation elements begin encroaching on BU property or into the Charles River.

Throughout the Project, possibilities to expand the PDW Path and associated green space have been a major topic of discussion and community priority. Given the narrowness of the Throat Area, one of the challenges associated with an at-grade solution is that it pushes the PDW Path beyond the bank and into the river and does not allow for its expansion. The rail-viaduct approach likewise does not allow for expansion of the riverbank path, but has been conceived of as allowing a bicycle pathway on the rail viaduct. Throughout the majority of the public involvement process, it has been generally agreed that staying out of the water sheet is advantageous from the perspectives of environmental stewardship and permitting; however, in March 2017, WalkBoston, a Task Force member, proposed filling the river to allow an at-grade solution to include not only expanded green space, but also separated pedestrian and cycling pathways. First suggested at a meeting of the Cambridgeport Neighborhood Association, audience reaction to this proposal was mixed, with some attendees expressing intense opposition to encroaching on the water sheet in this manner.

More generally, public reaction to the differing approaches for the Throat Area is mixed. Interactions with attendees at the March 6, 2017 City of Boston open house paralleled other reactions obtained from public meetings. The idea of "making the Turnpike disappear" through an at-grade solution is often seen as attractive, but the idea of an 8-foot PDW Path out over the Charles River is not viewed favorably.

Likewise, there is a feeling that having the rail lines, next to I-90, next to SFR, would make for a lot of infrastructure crowding the path and river. The rail-viaduct is initially seen as "just sort of flipping what's out there today," but the associated bicycle path connection, which is often described as running from a point on the backside of BU to the river pathway, is seen as highly attractive. A rebuilt highway-viaduct is often seen as "just replacing existing conditions," but the expansion of the pathway and green space it would offer is often seen as favorable. Given the variety of often-competing claims and aspirations associated with various options for the throat, it is hoped that full exploration of these issues through the DEIR process will help to provide some clarity in this area of the advancing design.

West Station and its Connections

From the outset of this Project in 2014, one of the chief desires of the Allston community has been the creation of West Station, a new commuter rail station serving the Lower Allston neighborhood on the Worcester/Framingham Line. The station was first formally integrated into the Project in September 2014 by then-Governor Deval Patrick, as a relatively modest rail stop, similar to Yawkey station on the same line. Through the public involvement process, however, the station has grown both in size and overall capabilities, now including a busway above the rail platforms and infrastructure to support connections between Commonwealth Avenue and Cambridge Street. Likewise, changes to the platform layout and the vertical layout of the station are the result of input from the public and the Task Force. The platform layout for the station has evolved into a three-platform system with the southern-most platform immediately adjacent to the BU property line, a center platform, and a northern platform, to best facilitate future cross-platform connections with urban rail service on the Grand Junction Line. Similarly, the vertical set-up of the station on two levels, with the rail platforms beneath and the busway above, evolved from the original layout of three levels, with platforms beneath an intermediate fair lobby and the busway above, as a result of public input.

Other community and Task Force hopes for West Station include: that it will serve as a connecting and terminating point for area bus routes, potentially for some form of bus rapid transit (BRT); that it will form a critical link in urban rail service to provide connections between Allston and Kendall Square via the Grand Junction Line; and that its presence will encourage and allow more people to access the future development at BPY by rail or bus, thereby cementing the area's transit-orientation and reducing both the presence of private vehicles and the roadway width needed to support them.

Dating back to its formal inclusion in 2014, there have been persistent rumors among the public and Task Force that West Station has since been dropped from the Project. However, West Station has been and is still being planned and permitted as one with the rest of the Project. How it is staged with the rest of the work will depend on factors including the staging of other elements in the Project, how funding becomes available, and how the need for the station develops. The last will evolve especially with New Boston Landing coming online in 2017, and offering a similar, one-seat ride to South Station. Nonetheless, MassDOT is keenly aware that the Allston, Brookline and Cambridge communities would like to see West Station built as soon as possible, especially in light of a Task Force proposal of an initial, temporary station similar to those further west at Newtonville and Auburndale, regardless of the staging of the full station.

West Station Connections

From 2014, MassDOT has included in all designs for West Station a bicycle and pedestrian connection from Commonwealth Avenue to Cambridge Street via West Station. A key characteristic of this connection is that it would offer cyclists a "no dismount" route between these two major roadways, which would be available at all times of day or night. This connection, sited in this document on Malvern Street, shares the broad approval of the Task Force and the community-at-large in Allston, Brookline and Cambridge.

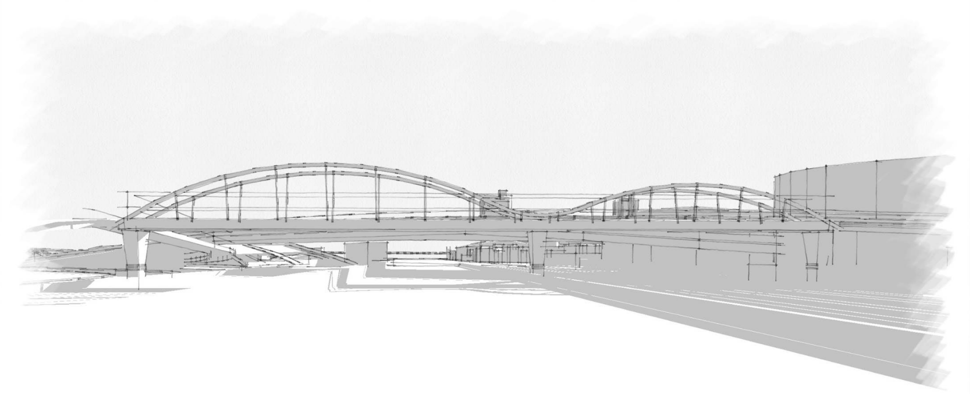
Per the scope given to MassDOT by the EOEEA in 2014, the Project Team has also fully investigated the idea of general-purpose or transit-only connections between Commonwealth Avenue and Cambridge Street, via Malvern Street and/or other connecting roads. The general-purpose vehicle connection is of particular interest to Task Force and community members representing the business interests of Allston, as it is seen as a way to remove trucks from the already-crowded routes of Linden Street and especially the northernmost block of Harvard Avenue approaching the intersection of Cambridge Street. As modeled by the Central Transportation Planning Staff (CTPS) of the Boston Metropolitan Planning Organization (MPO), and discussed at length elsewhere in this document, this connection would serve upwards of 20,000 vehicles per day in 2040, and would have a modest, positive impact on Harvard Avenue and Linden Street, but would also: require the taking of a privately-owned business for a ramp at Malvern Street/Ashford Street; run a high volume of vehicles past owner-occupied homes on Ashford Street; and filter a significant volume of traffic down small, residential streets in North Brookline, including Babcock Street and Pleasant Street. Residents of North Brookline have made their opposition to this connection clear in several meetings, most notably in the spring of 2017, and in some cases have gone so far as to caution against creating even a transit-only connection. As they argue, once a vehicle connection is made, there will be increasing pressure to open it to general-purpose traffic, as has happened with bypass roadways associated with the Big Dig that were originally designated as commercial-traffic only but have since had their access expanded to general-purpose vehicles. The introduction of a significant vehicle presence to Ashford, Babcock and Pleasant Streets is also out-of-keeping with instruction given to MassDOT by the Task Force: to protect residential streets from cut-through traffic.

In addition to the specifics of connections between Cambridge Street and Commonwealth Avenue, transit connections through the Project Area and via West Station are of broader interest among both Task Force and community members, and reflected in the BPDA Placemaking Study. The typical connection envisioned runs from Harvard Square, stopping at West Station, and then operating via Commonwealth Avenue and other roadways to the Longwood Medical Area (LMA). Among backers including both the City of Boston and members of the public, support for this connection is couched as helping to ensure that future BPY development is oriented towards transit, not vehicles. At the time of this writing, MassDOT has designated this connection as "do not preclude," meaning that nothing in 3K-Refined precludes its future construction; however, given that it would require property takings and that the service which would use it is as yet undefined, it is not included as part of the "opening day" package for 3K, as described in this document.

Other connections to West Station discussed by both the Task Force and the BPDA include the West Station Bypass Road and a bicycle/pedestrian connection from West Station directly to the PDW Path at a point around the BU Bridge. The West Station Bypass Road is envisioned as an elevated roadway providing general-purpose traffic connections from the Cambridge Street Bridge over I-90 at the western end of BPY, to West Station. Proponents couch their support for this roadway in terms of easing traffic burdens on Cambridge Street, thereby allowing this road to be narrower; and of effectively providing a noise-cancelling "lid" for rail operations running below. Some members of the Task Force have argued that this will speed up development of air rights over I-90, thereby more quickly building out the district in BPY. As with the bus connection at West Station, MassDOT has placed this roadway on the "do not preclude" list. The need for the roadway is not currently apparent, and it would introduce significant traffic immediately behind homes on Pratt and Ashford Streets. The Project already envisions creating a noise barrier behind these homes, and shifting the rail lines 10 feet to the north in concurrence with Task Force direction to make interchange and rail operations less-intrusive neighbors for the Allston community.

The pedestrian/bicycle connection from West Station to the PDW Path is generally presented as a component of the rail-viaduct 3K-AMP Throat Area Variation. This path would connect cyclists and pedestrians to the river along the rail viaduct, and could eventually be combined with a bicycle connection over the Grand Junction Bridge to Cambridge. There is nothing in 3K, regardless of which Throat Area Variation is chosen for eventual construction, which precludes later bicycle connections over the Grand Junction Bridge; however, the idea of the bicycle connection along the rail viaduct from West Station is at odds with direction MassDOT has received from the public and the Task Force, going back as far as 2014, to not isolate cyclists and pedestrians in long, elevated, below-grade, or otherwise enclosed-runs which could present possible public safety challenges or impediment to evacuation in case of emergency.

Franklin Street Footbridge



Sketch showing a steel-arch design for the Franklin Street Footbridge, presented to the Task Force on May 19, 2016 as part of a focused workshop on pedestrian structures

The Franklin Street Footbridge, which provides a bicycle and pedestrian connection from the end of Harvard Avenue to Franklin Street in Lower Allston, is of great and continual interest to the community and the Task Force. The bridge's route mimics historic connections at Franklin Street, which were initially an at-grade crossing of the railroad line, and then a tunnel under the rail lines after the at-grade crossing proved too dangerous. It is widely agreed among MassDOT, the community, and the Task Force that this is an important route, and that its reconstruction to current accessibility standards will strengthen bicycling and walking connections not only between Allston and Lower Allston, but with Brookline and Cambridge as well. Some early concepts of how a replacement bridge might be envisioned, both in terms of alignment and appearance, have been shared with the community and the Task Force over the summer and fall of 2016. Generally, the preference to-date has been for a structure which provides the most direct and visually-obvious connection from Harvard Avenue to Franklin Street, and which, from an aesthetic perspective, provides a gateway structure which references Allston's long railroad history. MassDOT is keenly aware that as construction staging for the Project is developed, community residents would like to see this reconstruction take place as early as possible.

Cambridge Street, South Cambridge Street and Connecting Roads

Broadly, the Allston community, the Task Force and BPDA the Placemaking Study are in agreement regarding the urban network of roads being developed to replace the current suburban style ramps, and about development of the vacant rail yard currently occupying BPY. In the particulars of both, however, there is an ongoing discussion about how many vehicular travel lanes are present on these roads, particularly at locations where pedestrians will be crossing the street. A strong desire for fewer lanes is most commonly voiced within the Task Force, with some members emphatically stating their belief that vehicular travel lane counts must be lower than what is present on nearby main roads in Allston, such as Brighton Avenue at Harvard Avenue. This, however, must be balanced against Task Force direction to not introduce new cut-through traffic into abutting Allston neighborhoods.

The Project Team also understands the importance of avoiding conditions of congestion so significant that driver behavior is negatively influenced, leading to behaviors such as "blocking the box" or creeping through red lights at intersections. Likewise, in line with MassDOT's goal—widely supported by the Allston community—to introduce separated bicycle facilities and fully protected intersections on most of the new roadways to be created between the Turnpike and local streets. It is important not to create conditions of congestion on these new routes so great that they lead to cyclist and pedestrian stress.

The desire to reduce lane count must also be balanced against concerns voiced at meetings in Cambridge and the City of Boston open house, at which residents have expressed their worry that their current, relatively high-speed access to the Turnpike will be negatively impacted by the shift to an urban-style interchange. Lastly, there is the widely acknowledged safety factor that the ramps leading off I-90 must not queue back onto the mainline, as currently happens at the Newton Corner eastbound exit.

Another area of major discussion is the connection between North Harvard Street and the streets leading to and from the Turnpike. Beginning in 2014, members of the Task Force and community made it clear to MassDOT that they did not wish to see a direct link between North Harvard Street and the Turnpike, as such a connection would increase traffic on this narrow, residential street, which is already shared between cars, cyclists and the heavily-used MBTA Route 66 bus. In keeping with this desire, Concepts 3J and 3K initially did not provide this link; however, it was then called for in the BPDA Placemaking Study, with the argument that it would open a better, more readily-developable parcel immediately adjacent to the roadway. This shift is in keeping with another stated neighborhood and Task Force desire to advance a plan for the Project which will allow more-rapid development of BPY. When this change was announced as part of the BPDA Placemaking Study in the summer of 2016, the Task Force offered no comment; however, among the general public, this connection remains of concern, and public comments were made against its inclusion at the Task Force meetings with the BPDA; at a public meeting in Allston in December 2016; and at the City of Boston open house in March 2017. It is anticipated that there will continued robust discussion on this connection in the DEIR commentary and beyond.

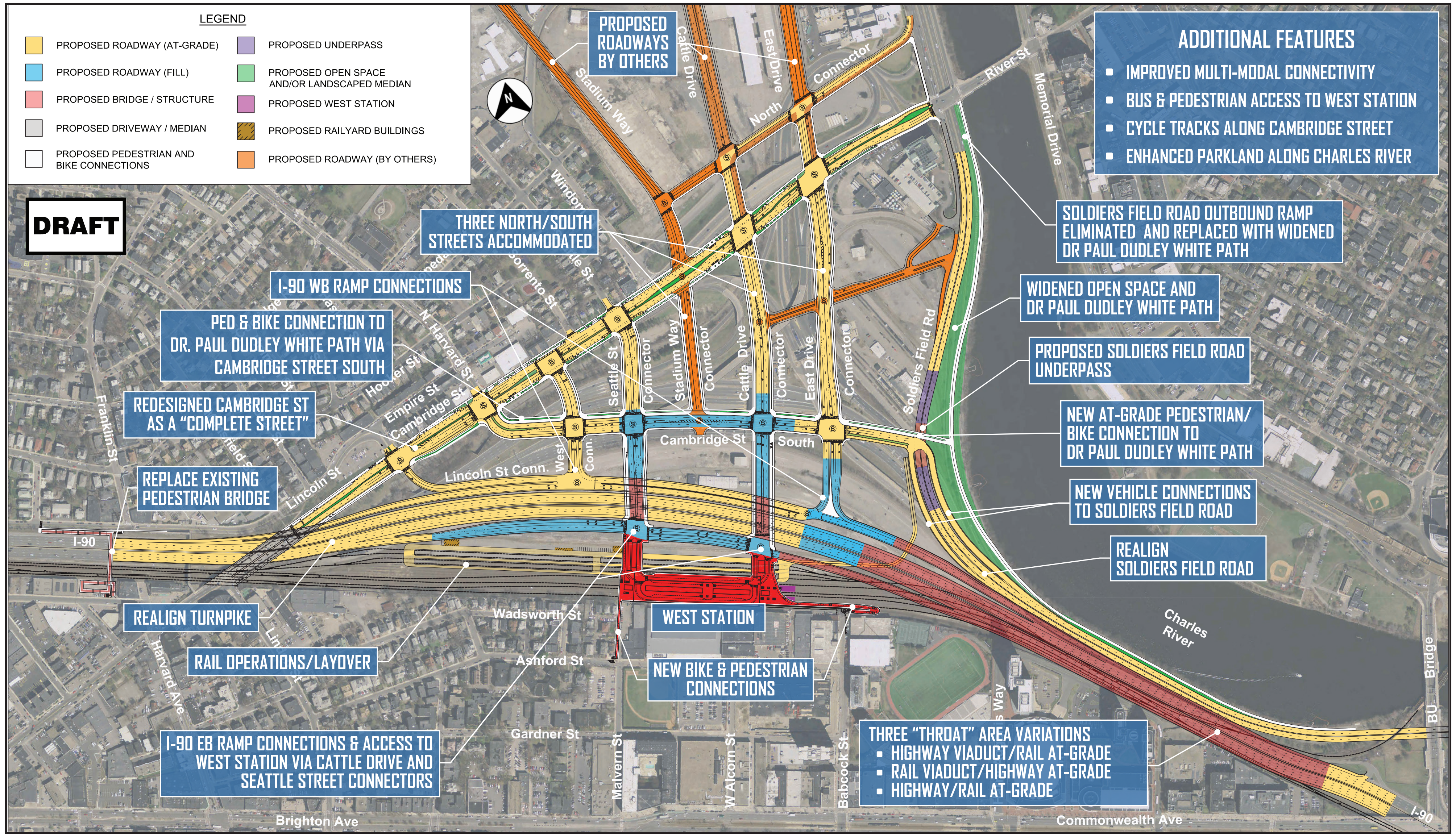
Under the Preferred Urban Interchange Concept 3K, the northern side of South Cambridge Street is envisioned as the primary bicycle and pedestrian connection between Lower Allston and the Charles River, to address the early Task Force input that "Allston is the closest neighborhood to the river, and yet it feels the furthest away." 3K envisions strengthening this route with protected intersections at crossings, and trees and/or other plantings along sections of separated bicycle facility running along the future development parcels. 3K further strengthens this connection with an at-grade, intersection-free transition between the South Cambridge Street separated bicycle facilities and the PDW Path. This addresses a Task Force critique of the 3K version of this bicycle facility, which described a potential safety hazard created if cyclists and motorists first encounter each other at the first intersection within BPY, immediately after emerging from conditions where the other was not present.

As with many elements of this Project, there is general agreement that this cycling facility should be present, but discussion remains as to whether it goes far enough, with some Task Force members arguing that it needs to be matched by an intersection-free route for cyclists between Lower Allston and the Charles River. This must be balanced, however, against other feedback from the Task Force that indicates that the bicycle facilities to the river should be relatively flat, without tunnels underneath or bridges above roads; that they should avoid long isolating runs which could lead to public safety issues; and that they should be permeable so that cyclists using them can make connections to other destinations and routes, including to future development within BPY or Commonwealth Avenue via West Station. General public comment on the South Cambridge Street bicycle facilities is positive, suggesting that efforts to respond to these goals are on the right track at least in part. As throughout much of this Project, there remains general agreement about the outlines of what should be built, with ongoing discussion regarding the degree to which these outlines have been achieved in the plans as developed to this point.

Spaces among the Connector Roads

Dating back to 2014, the Task Force and community members, as well as MassDOT and its Project Team, have shared a well-documented concern and general agreement regarding the need for the streets leading from Cambridge Street across Cambridge Street South to West Station to have the gentlest possible gradient in order to ensure easy passage to the station and over to Commonwealth Avenue for people walking, biking and using mobility aids. As a result, all slopes leading up to West Station laid out in Concept 3K-Refined are less than 5%, as requested by the BPDA in its Placemaking Study.

Over that time, there have been off-and-on requests, mostly by members of the Task Force, to add aprons, or widened areas, to the roadway ramps going into West Station that would be built on retained fill or viaduct. These widened areas could then be landscaped and equipped with benches or other street furniture, to make the space friendlier and more attractive, and the trip along the elevated section less daunting to those on foot or bicycle. The Long Street Bridge over I-70 in Columbus, Ohio is frequently cited as the inspiration for this request. For some members of the Task Force and a handful of community members, these aprons do not go far enough and should expand into full decking of any gaps among the elevated roadway sections, well in advance of any planned structures to be placed by the landowner. Support for this approach is typically couched in terms of suppressing noise from highway and rail operations and, as with the aprons, making passage along the elevated roadways feel more comfortable and less exposed. For the purposes of the DEIR, MassDOT has placed creation of aprons or decks in the "do not preclude" category. Doing so is in keeping with the recommendation of the BPDA Placemaking Study that MassDOT do nothing which precludes a range of successful placemaking outcomes within the future BPY district. Aprons or decks, which might or might not fit well with future and as-yet-unknown development plans, could hamper those plans and interfere with the rapid development of the district as envisioned by the landowner, BPDA and community members.


LEGEND
🟨 PROPOSED ROADWAY (AT-GRADE)
🟦 PROPOSED ROADWAY (FILL)
🟥 PROPOSED BRIDGE / STRUCTURE
⬜ PROPOSED DRIVEWAY / MEDIAN
⬜ PROPOSED PEDESTRIAN AND BIKE CONNECTIONS
🟪 PROPOSED UNDERPASS
🟩 PROPOSED OPEN SPACE AND/OR LANDSCAPED MEDIAN
🟪 PROPOSED WEST STATION
▨ PROPOSED RAILYARD BUILDINGS
🟧 PROPOSED ROADWAY (BY OTHERS)
DRAFT
N
PROPOSED ROADWAYS BY OTHERS
ADDITIONAL FEATURES
▪ IMPROVED MULTI-MODAL CONNECTIVITY
▪ BUS & PEDESTRIAN ACCESS TO WEST STATION
▪ CYCLE TRACKS ALONG CAMBRIDGE STREET
▪ ENHANCED PARKLAND ALONG CHARLES RIVER
SOLDIERS FIELD ROAD OUTBOUND RAMP ELIMINATED AND REPLACED WITH WIDENED DR PAUL DUDLEY WHITE PATH
THREE NORTH/SOUTH STREETS ACCOMMODATED
I-90 WB RAMP CONNECTIONS
PED & BIKE CONNECTION TO DR. PAUL DUDLEY WHITE PATH VIA CAMBRIDGE STREET SOUTH
WIDENED OPEN SPACE AND DR PAUL DUDLEY WHITE PATH
PROPOSED SOLDIERS FIELD ROAD UNDERPASS
REDESIGNED CAMBRIDGE ST AS A "COMPLETE STREET"
NEW AT-GRADE PEDESTRIAN/ BIKE CONNECTION TO DR PAUL DUDLEY WHITE PATH
REPLACE EXISTING PEDESTRIAN BRIDGE
NEW VEHICLE CONNECTIONS TO SOLDIERS FIELD ROAD
REALIGN SOLDIERS FIELD ROAD
REALIGN TURNPIKE
WEST STATION
RAIL OPERATIONS/LAYOVER
NEW BIKE & PEDESTRIAN CONNECTIONS
I-90 EB RAMP CONNECTIONS & ACCESS TO WEST STATION VIA CATTLE DRIVE AND SEATTLE STREET CONNECTORS
THREE "THROAT" AREA VARIATIONS
▪ HIGHWAY VIADUCT/RAIL AT-GRADE
▪ RAIL VIADUCT/HIGHWAY AT-GRADE
▪ HIGHWAY/RAIL AT-GRADE
Stadium Way
Cattle Drive
East Drive
Connector
North
River St
Memorial Drive
Windom
Sorrento St
N. Harvard St
Hooker St
Empire St
Cambridge St
Franklin St
Lincoln St
Lincoln St Conn.
Seattle St
West
Conn.
Connector
Soldiers Field Rd
South
I-90
Wadsworth St
Ashford St
Harvard Ave
Gardner St
Malvern St
W Alcorn St
Babcock St
Brighton Ave
Commonwealth Ave
Charles River
BU Bridge
I-90

Overview of major features and refinements to concept 3K-Refined, prepared for the December 8, 2016 Public Information Meeting.

River Street Reconfiguration

I-90 Urban Interchange 3K Preferred Concept 3K takes advantage of the eventual termination of rail service on the spur track to Houghton Chemical Corporation—negotiated among Harvard University, CSX Railroad and Houghton Chemical—in order to realign a section of SFR deeper west into the BPY parcel. This would create approximately two acres of additional green space along the Charles River, in an area roughly bounded by the DoubleTree Hotel and the point at which SFR bends eastward to head towards downtown Boston. This realignment has been combined with two other important elements: removal of the exit ramp from SFR at River Street; and replacement with a new connection that would provide a route connecting SFR and the Turnpike, as well as destinations within BPY, at a point roughly opposite the Riverside Boat Club and Micro Center in Cambridge. Under this concept, the mainline of SFR would pass under this entrance and exit in a depressed (also known as a "boat") section, with the South Cambridge Street bicycle facilities tying into the PDW Path just north of the entrance/exit roadways.

This approach meets an important mix of Task Force, community and BPDA goals dating as far back as 2014; particularly, the desire to improve "the narrows," an extremely narrow section of the PDW Path just south of River Street, noted for cycling crashes; and the desire to keep traffic that is moving between SFR and the I-90 as close to the mainline of those two major arteries as possible, thereby reducing the burden on Cambridge Street and potentially the number of that roadway's vehicular travel lanes. Generally, this change is viewed positively in Allston, neutrally in Brookline, and with great concern in Cambridge. This is particularly notable in Cambridgeport, where residents fear that because trips home from places like Logan Airport would require a series of right turns within the BPY area, there would be a resultant shift in traffic to Memorial Drive, which would in turn generate more traffic noise in Cambridgeport. Likewise, some commentary has been received which questions the wisdom of placing an important piece of infrastructure—the SFR underpass—immediately adjacent to the river, given the anticipated rise in water levels and storm surges associated with climate change.

Ongoing Concerns Regarding Placemaking

A number of concerns regarding the future of BPY, well-documented through the public involvement process, remain important components of the ongoing conversations about this area and its future, and cannot in part or in full, be satisfied by MassDOT as part of this Project. Many of these concerns were also flagged by the BPDA in its Placemaking Study as issues that will be appropriate to explore in future master planning for BPY. These include green space within the parcel as part of ongoing development, affordable housing, and the permeability and 'neighborhood-feel' of the district.

Frequently, members of the Task Force and other advocates closely interested in the Project note that while the additional green space along the river and the "green spine" associated with the South Cambridge Street separated bicycle facility are positive developments, they should be augmented by additional green space within the development area itself. While MassDOT and its Project Team view this as a worthy goal, development of this space – whether in the form envisioned in the BPDA Placemaking Study or some other configuration – will have to be addressed between the City of Boston, the Allston Community, and the landowner, Harvard University.

Another concern that emerged through the placemaking process and in the course of both public and Task Force meetings, is the idea that the BPY development should feature a significant proportion of affordable housing. Concern over neighborhood stability is particularly evident in the idea that the Lower Allston neighborhood is the last bastion of owner-occupied housing in an area increasingly turned over to student rentals that are owned by absentee landlords. This concern was especially noted in the conversation surrounding the direct connection of North Harvard Street. This suggests that though these concerns are not at the forefront of conversation at present, they will need to be addressed at some point between the Allston community, the BPDA and the landowner as development continues, especially in the BPY district.

Lastly, there is the idea of ensuring public permeability from Lower Allston down to the river and across to Commonwealth Avenue. Similar to the concerns expressed regarding affordable housing and neighborhood stability, there has been an undercurrent of commentary suggesting that whatever is developed at BPY should feel like an extension of the neighborhood, through which neighborhood residents are welcome to pass, rather than a gated college campus. While MassDOT can to some extent support this by ensuring that all feel welcome on the rights-of-way through the BPY, (including creating an attractive connection out to the river along the South Cambridge Street separated bicycle facility), policies and practices regarding lands not owned by MassDOT, such as access to any potential future green spaces created within the parcel, will need to be worked out eventually among the landowner, BPDA, and the Allston community.

9.2.3 Conclusion

Preferred Urban Interchange 3K and its three Throat Area Variations, highway-viaduct (3K-HV), rail-viaduct (3K-AMP) and at-grade (3K-ABC), are all presented herein. Included are major elements, referenced briefly in this section and in much greater detail elsewhere in this document, including: West Station; a full delineation of potential connections between Cambridge Street and Commonwealth Avenue; the Franklin Street Footbridge; the various roadways within BPY itself; and the intertwined changes at River Street and access between SFR and I-90 as well as the BPY parcel. The graphic on the following page illustrates the major features and refinements to concept 3K-Refined, as prepared for the December 8, 2016 Public Information Meeting.

The entire Project will be subject to analysis for noise, air quality, constructability, environmental justice, economic development potential, traffic, rail operations, storm water management, climate change resiliency and more. The analyses conducted in this document will be shared both with the Task Force and the general community, in order to address in further detail the multitude of questions that the public involvement process has thus far turned up. This will include more concrete answers to some questions that, to-date, the Project Team has not been able to answer given the preliminary stage of design. As the ENF did in 2014, the DEIR now represents a major milestone and the appropriate moment to take all the hard work done in this phase by the community, the Task Force and the Project Team, and bring the Project into the next, sharper level of focus.

One of the recurring themes of the public involvement process since 2014, reflected at several points within this section, is that MassDOT is frequently required to balance and integrate direction from Task Force members that contradicts, in whole or in part, either their prior direction or ongoing direction from the broader Allston community. It is hoped through some of these contradictions can be resolved through issuance of and commentary on the DEIR.

Nonetheless, as was stated at the end of the section detailing public involvement for the ENF, nobody to date has looked at Preferred Urban Interchange 3K and said “that isn’t it.” There remains broad agreement that the I-90 Allston Interchange should be replaced with a new, urban-style interchange that better blends with the Allston community. Likewise, MassDOT and the community are generally in agreement with many of the recommendations of the BPDA Placemaking Study. Indeed, incorporation of those recommendations, either as fully integrated into the concept or as items not precluded by the design, led to the refinements presented herein.

Some quotes, drawn from the December 8, 2016 and January 19, 2017 public meetings in Allston and Cambridge respectively, are illustrative: “Let me just thank everyone for the improvements that have been made over the last year. I was particularly impressed with the new open space against the river,” and “Thank you. I’m seeing lots of improvements. This will slow down traffic and make the intersections safer.”

Outside of the discussion regarding the Throat Area Variations, which perforce is something of an “either/or” conversation, much of the ongoing conversation between MassDOT and the community does not disagree on the broad bones of the Project Plan and the shared goals for it, frequently articulated at the beginning of presentations to the public. As when the ENF was filed in 2014, many of the outstanding issues are questions of degree: do the transportation changes outlined in 3K provide adequate green space and enough improvement to bicycle and pedestrian amenities along the Charles River? Do the connections made at West Station make a strong-enough down-payment on future multimodal connections, if on opening day not all modes are served equally and as they will be served in the final condition? Which design refinements offer the best set-up to foster future urban rail service over the Grand Junction Line, even if that service will need to be established by another Project?

MassDOT is also keenly aware of the desire for ongoing public involvement, and remains committed to a thorough and comprehensive public involvement process as it works to process the input it expects to receive on the DEIR. As was done just prior to the 2014 filing of the ENF, MassDOT will convene a task force meeting immediately in advance of filing the DEIR. The goal of this meeting will be to brief task force members on what the DEIR contains and how they can comment on it. A secondary goal of this meeting will be resourcing task force membership to best fulfill one of their primary functions of bringing the contents of the DEIR back to their various constituencies to help increase public awareness of the filing and participation in the process associated with it. Following the meeting with the task force, a public information meeting regarding the DEIR will be held during the comment period on that document. All materials generated to support this effort will be placed on the project website as have all earlier public involvement materials.

As the agency looks to answer questions including those listed above while reconciling conflicting input from various avenues of public involvement, it will likewise continue to seek ways for both the dedicated members of the Task Force and the broader community to help guide the agency’s efforts as it advances the replacement for the I-90 Allston Interchange and its aging viaduct through the Final Environmental Impact Report (FEIR) and beyond to final design and construction. It is anticipated that the FEIR preparation phase of the project will include continued outreach to the general public and work with the task force. Thorough documentation will continue as will the practice of making materials digitally available. The exact outlines of this work will be determined in a large part by the comments MassDOT and its team receive on the DEIR.

Table 9.2-1 provides a list of the Task Force members and Table 9.2-2 summarizes the public participation events to date.

Table 9.2-1: Allston Task Force Members

Name	Affiliation
Gerald Autler[1]	Boston Planning and Development Agency
Harris Band	Harvard University
Joseph Beggan	Harvard University
Andrew Bettinelli	Office of Senator Brownsberger
Jorge Briones	MBTA
William Brownsberger	State Senate
Mark Ciommo	Boston City Council
Henrietta Davis	Cambridgeport Resident
Bill Deignan	City of Cambridge
Sal DiDomenico	State Senate
Anthony D'Isidoro	Allston Civic Association
Brian Doherty	Boston Building Trade Council
Paola Ferrer	Community Member
Richard Fries[2]	MassBike
Jim Gillooly	Boston Transportation Department
Anabela Gomes	Brighton Allston Improvement Association
Vineet Gupta	Boston Transportation Department
Karl Haglund[3]	Department of Conservation and Recreation
Kevin Honan	House of Representatives
Bruce Houghton	Houghton Chemical
Marc Kadish	Allston Board of Trade
Wendy Landman	WalkBoston
Elizabeth Leary	Boston University
Oscar Lopez	Representative Honan's Office
David Loutzenheiser	Metropolitan Area Planning Council
Sean Macaluso	Office of Senator DiDomenico
Wayne MacKenzie	Community Member
Mary Maguire	AAA Southern New England
Clancy Main	Office of Councilor Ciommo
Pallavi Mande	Charles River Watershed Association
Harry Mattison	Community Member
Ken Miller[4]	Federal Highway Administration
Galen Mook	Community Member
Michael Moran	House of Representatives
Tom Nally	A Better City
Paul Nelson	MASCO
Ari Ofsevit	LivableStreets Alliance
Warren J. O'Reilly[5]	Mayor's Office of Neighborhood Services
Richard Parr[6]	Community Member
John Pourbaix	Construction Industries of Massachusetts
Susanne Rasmussen	City of Cambridge
Tad Read	Boston Planning and Development Agency
Carol Ridge-Martinez	Allston-Brighton CDC
Jessica Robertson	Community Member
Stefanie Seskin[7]	Boston Transportation Department
Steve Silveira	Boston University
Margaret Van Deusen	Charles River Watershed Association
Emma Walters[8]	Allston Village Main Streets
Jillian Zywien	Mass Motor Association

1 Replaced David Grissino as representative of the Boston Planning and Development Agency (formerly Boston Redevelopment Authority). 2 Replaced Barbara Jacobson as representative of MassBike.3 Replaced Patrice Kish as representative of the Department of Conservation and Recreation. 4 Replaced Kevin Wright as representative of the Federal Highway Administration. 5 Replaced Amy Mahler, who previously replaced John Laadt, as representative of Mayor Walsh's Office of Neighborhood Services. 6 Replaced Matthew Danish as community representative. 7 Replaced Kim Foltz as representative of Boston Bikes within the Boston Transportation Department. 8 Replaced Alana Olsen as representative of Allston Village Main Streets.

Table 9.2-2: Public Participation Events

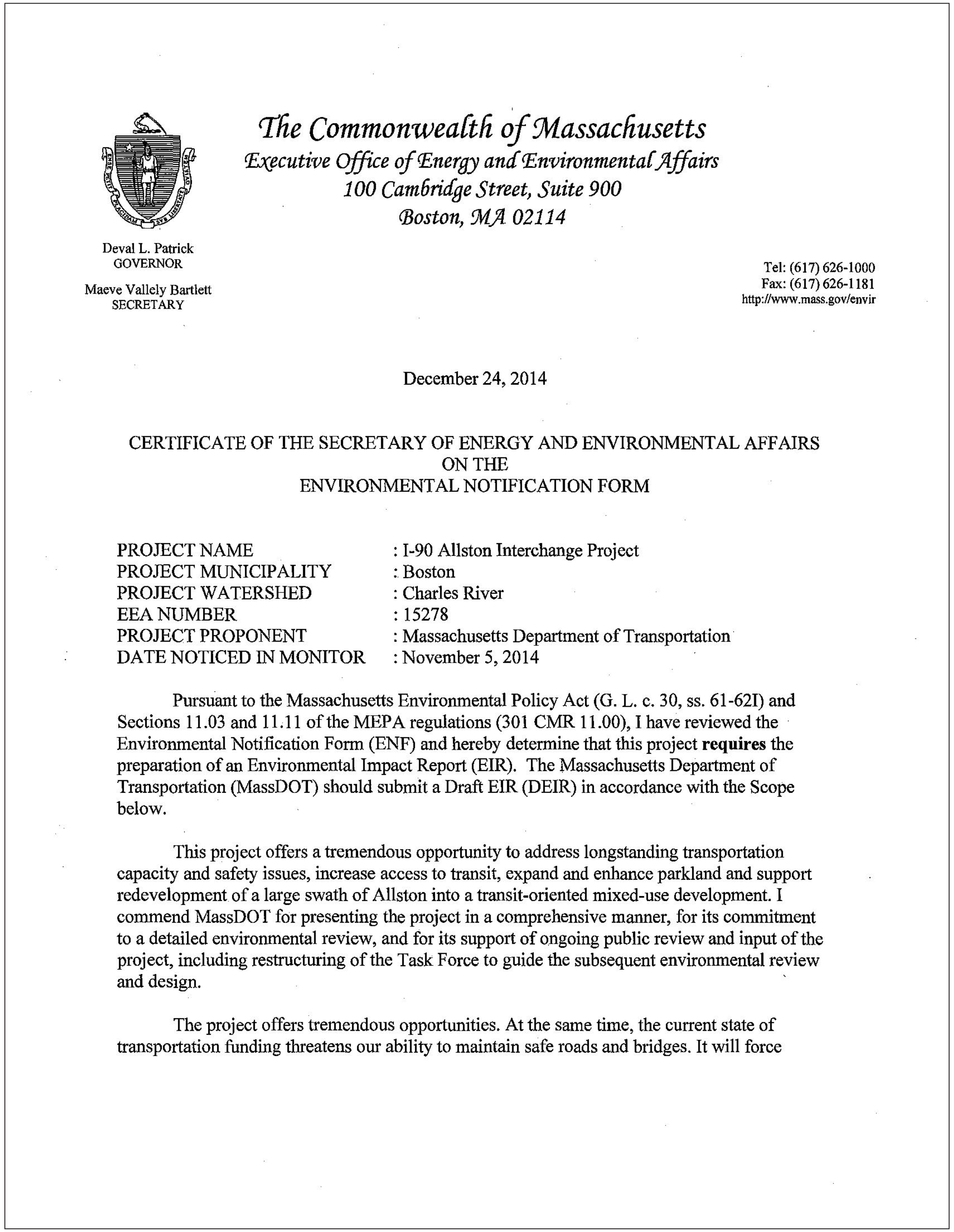
Year	Task Force	Public	Targeted	BPDA	City of Cambridge
2014	2/5/14 FHWA Meeting	4/10/14 Public Information Meeting	8/14/14 Esplanade Association Meeting		5/1/2014 Cambridge City Council Briefing
	5/7/14 Task Force Meeting with MassDOT	9/18/14 Public Information Meeting	9/23/14 Cambridgeport Neighborhood Association Briefing		9/24/14 Cambridge City Staff Meeting
	5/21/2014 Task Force Meeting	11/20/14 MEPA Consultation Meeting	10/21/14 BSA Meeting		
	6/11/14 Task Force Meeting		12/10/14 Allston Civic Association Meeting		
	6/25/14 Task Force Meeting				
	7/16/2014 Task Force Meeting				
	8/7/14 Boston Transportation Dept. & Boston Redevelopment Authority Internal Meeting				
	8/13/14 City of Boston & MassDOT Meeting				
	8/19/14 Internal Meeting				
	8/28/14 BRA Internal Meeting				
	9/3/2014 Task Force Meeting				
	10/1/14 Task Force Meeting				
	10/15/14 Task Force Meeting				
	11/5/14 Task Force Meeting				
2015	7/15/15 CRWA Meeting	6/17/15 Public Information Meeting	12/15/15 Cambridgeport Neighborhood Association Briefing		
	8/19/15 CRWA Meeting	12/8/15 Public Information Meeting			
	9/17/15 CRWA Meeting				
	10/15/15 CRWA Meeting				
	10/29/15 CRWA Meeting				
	11/16/15 CRWA Meeting				
	11/19/15 CRWA Meeting				
	12/2/15 CRWA Meeting				
	12/17/15 CRWA & Cecil Group Meeting				

Year	Task Force	Public	Targeted	BPDA	City of Cambridge
2016	1/11/2016 BRA Meeting	12/8/16 Public Information Meeting	2/29/16 Brookline Traffic Briefing		4/27/16 City of Cambridge Parking, Traffic, & Transportation Dept. Meeting
	1/20/2016 BRA Meeting		2/29/16 Brookline Traffic Briefing		10/12/16 City of Cambridge Parking, Traffic, & Transportation Dept. Meeting
	2/11/2016 MassDOT 3K, A Better City (ABC), & Amateur Planner		3/20/16 Brookline Traffic Briefing		
	2/13/2016 BRA Meeting		4/22/16 Allston Village Main Streets Briefing		
	2/24/16 Taskforce Meeting		5/12/16 Allston/Brighton CDC		
	3/10/16 Taskforce Meeting		6/3/16 City of Boston Councilors Briefing		
	3/30/2016 Site Walk		6/7/16 City of Boston Councilors Briefing		
	4/7/16 Taskforce Meeting				
	4/28/16 Taskforce Meeting				
	5/19/2016 Task Force Meeting				
	6/15/16 Taskforce Meeting				
	6/16/16 CRWA Meeting				
	6/27/2016 BRA Meeting				
	7/13/2016 BRA Meeting				
	10/13/2016 Task Force Meeting				
2017	3/28/17 Internal DEIR Authors' Meeting	2/7/2017 Taskforce Organized Public Information Meeting	1/19/17 Cambridge Neighborhood Association Briefing	9/26/2017 BPDA Meeting	4/27/17 City of Cambridge Parking, Traffic, & Transportation Dept. Meeting
			3/30/17 Cambridge Neighborhood Association Briefing		
			4/13/17 Cambridge Neighborhood Association Briefing		

COMMENTER
Marilyn Wellons
Galen Mook
Peter Klinefelter
Harry Mattison and Alana Olsen
John Sanzone, Jr.
Judith Motzkin
Karen Smith
Michael Monroe
Jennifer Lee Mills
Karen DiFranza
Scott Devlin
Christopher Ott
Christopher Conroy
Chris Dippel
Stephan Jacobs
Michael Immel
Debra Iles
Yurij Roman Lojko
Sarah MacDonald
Melissa Mattison
Carol Schauer
Susan Donaldson
Pauline Lim
Paul Fein
Deborah Stein Sharpe
Liam Sullivan
Erica Reisman
Patricia Maher
Megan Ramey
Emily Marvosh
Nicole Manseau
Eric Anderson

COMMENTER
Henry Leiberman
Patricia Hogan
Douglas Ely
Alisha Fowler
Meg Muckenhoupt
Andrea Yakovakis
Maria Simoneau
Theresa Smith
Andrea Love
Colin Durrant
Matthew Wilkinson
Andrew Farnitano
Miles Grant
Dorothy Fennell
Jane Hayes
Xander Miller
Jane McHale
Tom Parks
Xavid Pretzer
Jennifer Uhrhane
Alexander Calhoun
Molly Reinero
Matthew Welch
Lauren Greenberg
Jeremy Hanson
Bruce Lederer
John and Marilyn MacDougall
Alex Epstein
Dimitri Kountourogianni
John Pelletier
Ania Wieckowski
Erica Mattison

COMMENTER
Julia Hansen
Matthew Soule
Matt Lawlor
Todd Consentino
Kathryn Fahey
Allie Sherwood
Stephanie Danielson
Ari Ofsevit
Nina Garfinkle
Caryn Oppenheim
Joshua Bellin
Joyce Radnor
David Kuss
Arlene Mattison
Ian Hutchinson
Jason Nelson
Franklin King IV
Kate Kelly
Elizabeth Egan



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December 24, 2014

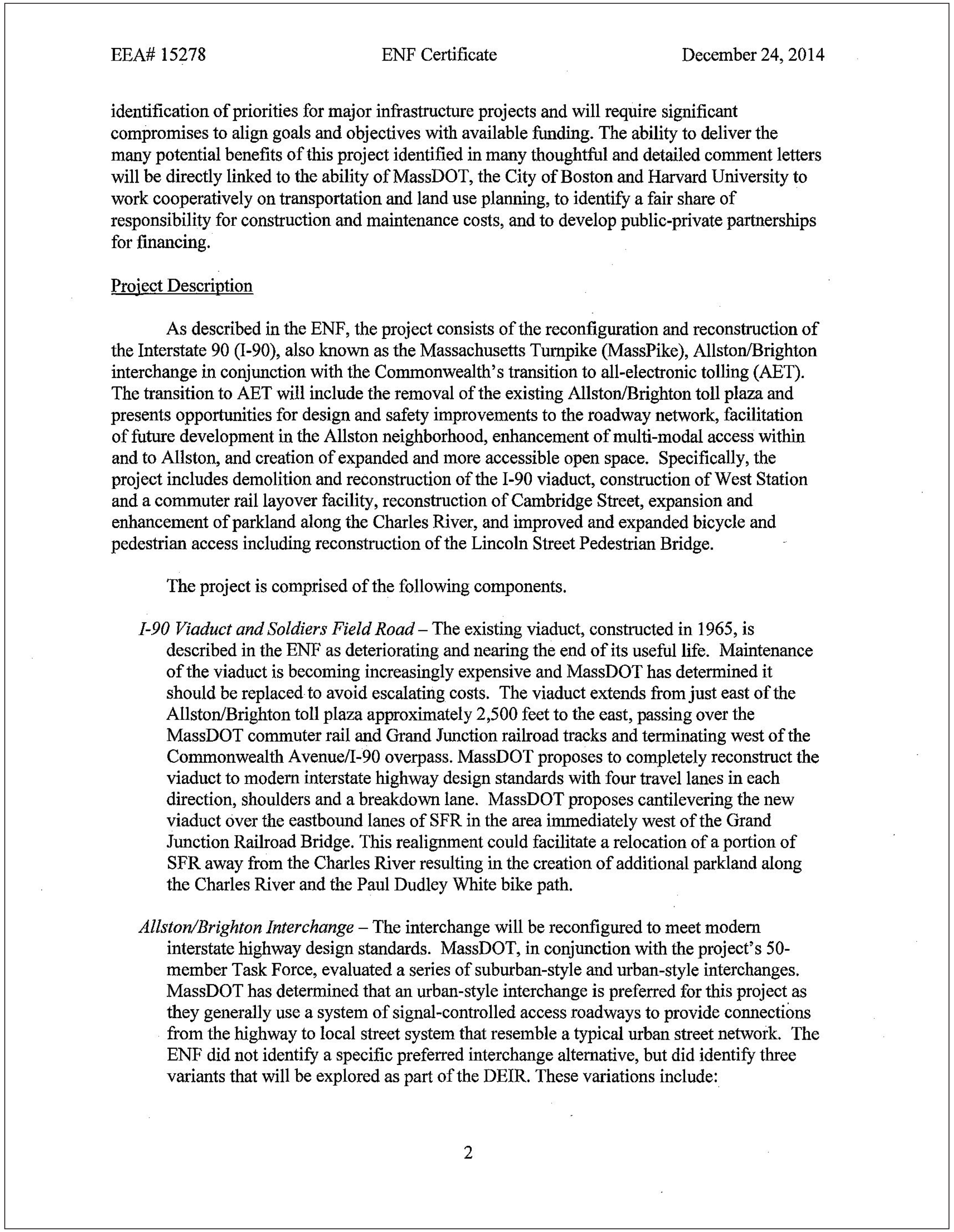
CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: I-90 Allston Interchange Project
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Charles River
EEA NUMBER	: 15278
PROJECT PROPONENT	: Massachusetts Department of Transportation
DATE NOTICED IN MONITOR	: November 5, 2014

Pursuant to the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62I) and Sections 11.03 and 11.11 of the MEPA regulations (301 CMR 11.00), I have reviewed the Environmental Notification Form (ENF) and hereby determine that this project **requires** the preparation of an Environmental Impact Report (EIR). The Massachusetts Department of Transportation (MassDOT) should submit a Draft EIR (DEIR) in accordance with the Scope below.

This project offers a tremendous opportunity to address longstanding transportation capacity and safety issues, increase access to transit, expand and enhance parkland and support redevelopment of a large swath of Allston into a transit-oriented mixed-use development. I commend MassDOT for presenting the project in a comprehensive manner, for its commitment to a detailed environmental review, and for its support of ongoing public review and input of the project, including restructuring of the Task Force to guide the subsequent environmental review and design.

The project offers tremendous opportunities. At the same time, the current state of transportation funding threatens our ability to maintain safe roads and bridges. It will force



identification of priorities for major infrastructure projects and will require significant compromises to align goals and objectives with available funding. The ability to deliver the many potential benefits of this project identified in many thoughtful and detailed comment letters will be directly linked to the ability of MassDOT, the City of Boston and Harvard University to work cooperatively on transportation and land use planning, to identify a fair share of responsibility for construction and maintenance costs, and to develop public-private partnerships for financing.

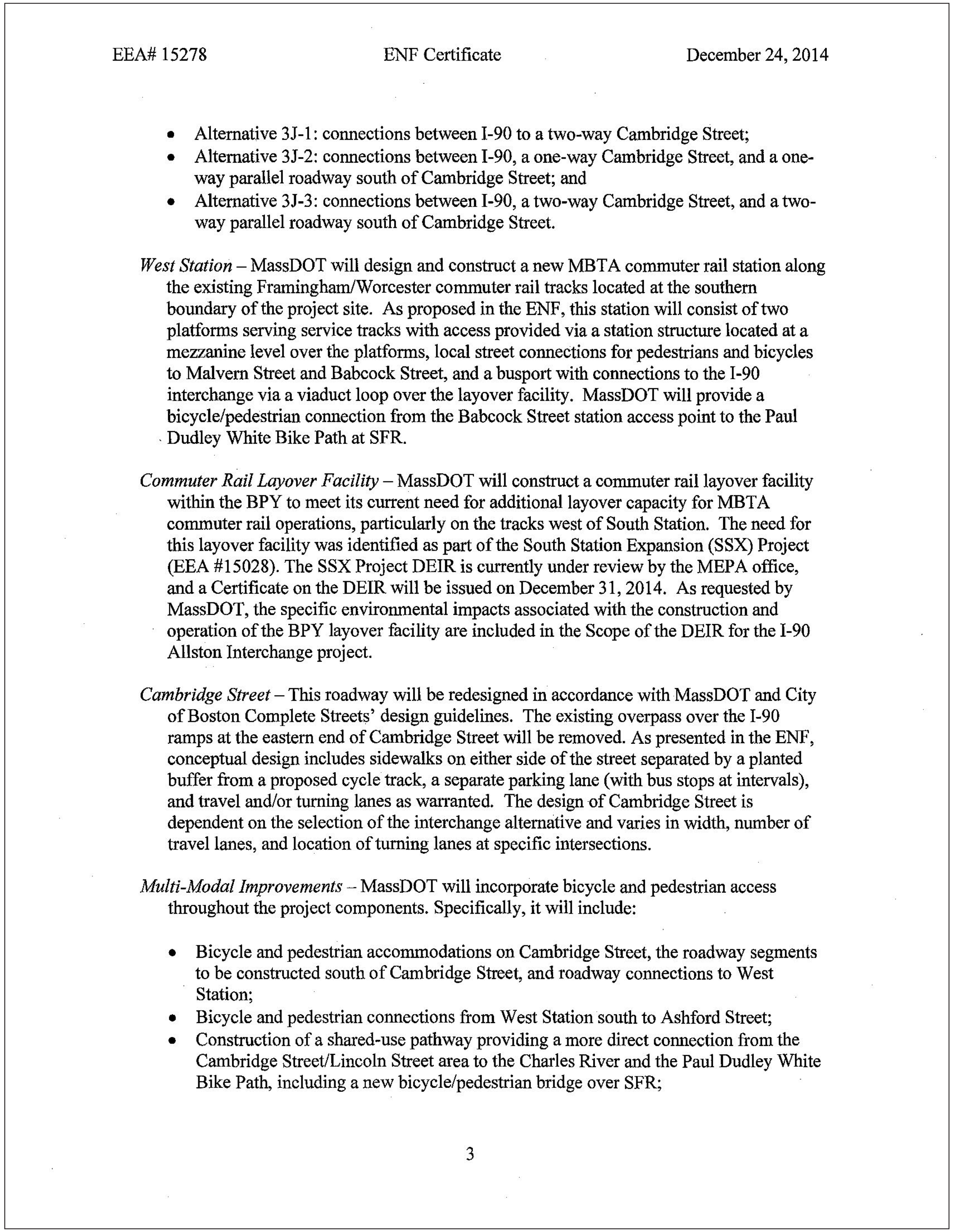
Project Description

As described in the ENF, the project consists of the reconfiguration and reconstruction of the Interstate 90 (I-90), also known as the Massachusetts Turnpike (MassPike), Allston/Brighton interchange in conjunction with the Commonwealth's transition to all-electronic tolling (AET). The transition to AET will include the removal of the existing Allston/Brighton toll plaza and presents opportunities for design and safety improvements to the roadway network, facilitation of future development in the Allston neighborhood, enhancement of multi-modal access within and to Allston, and creation of expanded and more accessible open space. Specifically, the project includes demolition and reconstruction of the I-90 viaduct, construction of West Station and a commuter rail layover facility, reconstruction of Cambridge Street, expansion and enhancement of parkland along the Charles River, and improved and expanded bicycle and pedestrian access including reconstruction of the Lincoln Street Pedestrian Bridge.

The project is comprised of the following components.

I-90 Viaduct and Soldiers Field Road – The existing viaduct, constructed in 1965, is described in the ENF as deteriorating and nearing the end of its useful life. Maintenance of the viaduct is becoming increasingly expensive and MassDOT has determined it should be replaced to avoid escalating costs. The viaduct extends from just east of the Allston/Brighton toll plaza approximately 2,500 feet to the east, passing over the MassDOT commuter rail and Grand Junction railroad tracks and terminating west of the Commonwealth Avenue/I-90 overpass. MassDOT proposes to completely reconstruct the viaduct to modern interstate highway design standards with four travel lanes in each direction, shoulders and a breakdown lane. MassDOT proposes cantilevering the new viaduct over the eastbound lanes of SFR in the area immediately west of the Grand Junction Railroad Bridge. This realignment could facilitate a relocation of a portion of SFR away from the Charles River resulting in the creation of additional parkland along the Charles River and the Paul Dudley White bike path.

Allston/Brighton Interchange – The interchange will be reconfigured to meet modern interstate highway design standards. MassDOT, in conjunction with the project's 50-member Task Force, evaluated a series of suburban-style and urban-style interchanges. MassDOT has determined that an urban-style interchange is preferred for this project as they generally use a system of signal-controlled access roadways to provide connections from the highway to local street system that resemble a typical urban street network. The ENF did not identify a specific preferred interchange alternative, but did identify three variants that will be explored as part of the DEIR. These variations include:



- Alternative 3J-1: connections between I-90 to a two-way Cambridge Street;
- Alternative 3J-2: connections between I-90, a one-way Cambridge Street, and a one-way parallel roadway south of Cambridge Street; and
- Alternative 3J-3: connections between I-90, a two-way Cambridge Street, and a two-way parallel roadway south of Cambridge Street.

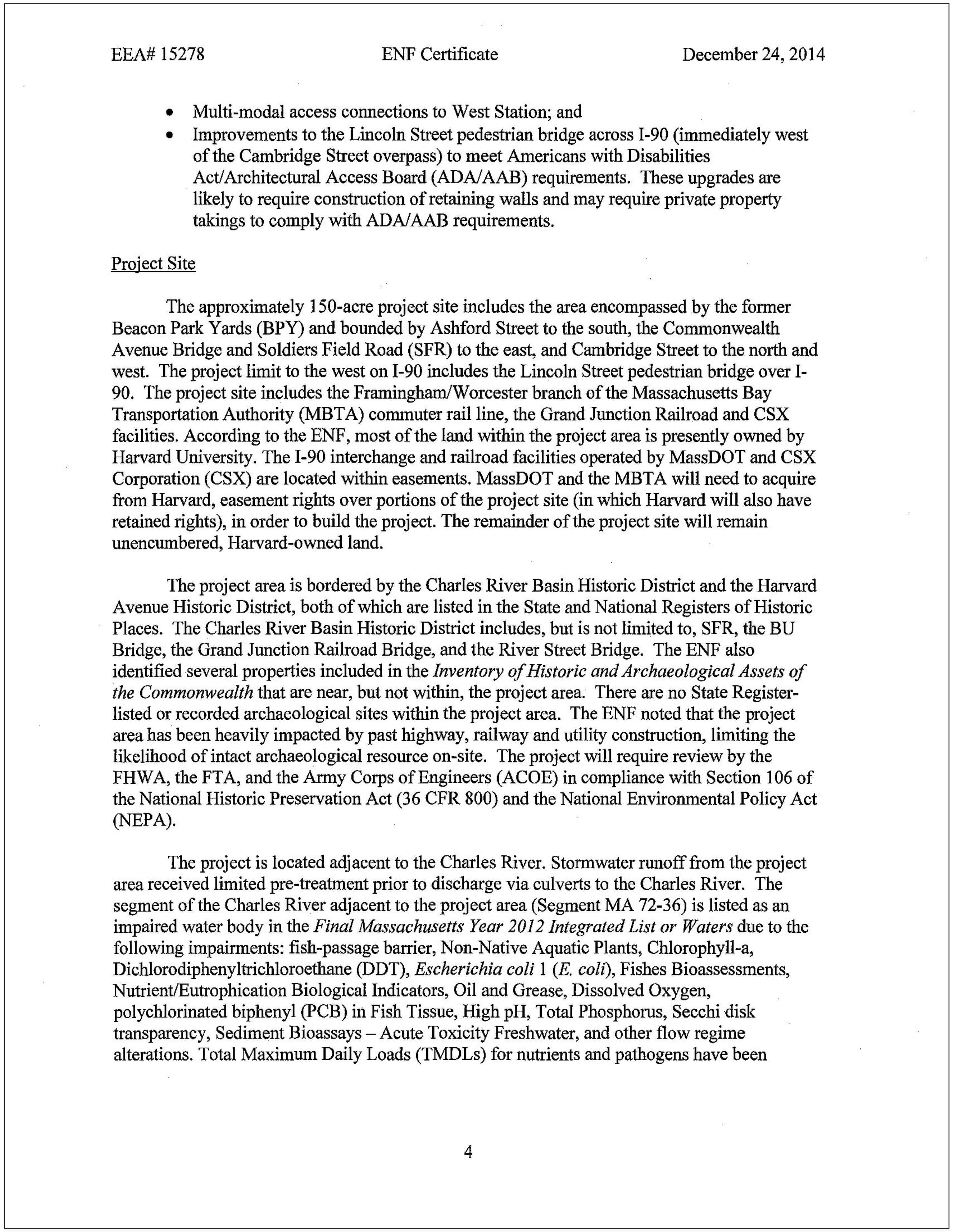
West Station – MassDOT will design and construct a new MBTA commuter rail station along the existing Framingham/Worcester commuter rail tracks located at the southern boundary of the project site. As proposed in the ENF, this station will consist of two platforms serving service tracks with access provided via a station structure located at a mezzanine level over the platforms, local street connections for pedestrians and bicycles to Malvern Street and Babcock Street, and a busport with connections to the I-90 interchange via a viaduct loop over the layover facility. MassDOT will provide a bicycle/pedestrian connection from the Babcock Street station access point to the Paul Dudley White Bike Path at SFR.

Commuter Rail Layover Facility – MassDOT will construct a commuter rail layover facility within the BPY to meet its current need for additional layover capacity for MBTA commuter rail operations, particularly on the tracks west of South Station. The need for this layover facility was identified as part of the South Station Expansion (SSX) Project (EEA #15028). The SSX Project DEIR is currently under review by the MEPA office, and a Certificate on the DEIR will be issued on December 31, 2014. As requested by MassDOT, the specific environmental impacts associated with the construction and operation of the BPY layover facility are included in the Scope of the DEIR for the I-90 Allston Interchange project.

Cambridge Street – This roadway will be redesigned in accordance with MassDOT and City of Boston Complete Streets' design guidelines. The existing overpass over the I-90 ramps at the eastern end of Cambridge Street will be removed. As presented in the ENF, conceptual design includes sidewalks on either side of the street separated by a planted buffer from a proposed cycle track, a separate parking lane (with bus stops at intervals), and travel and/or turning lanes as warranted. The design of Cambridge Street is dependent on the selection of the interchange alternative and varies in width, number of travel lanes, and location of turning lanes at specific intersections.

Multi-Modal Improvements – MassDOT will incorporate bicycle and pedestrian access throughout the project components. Specifically, it will include:

- Bicycle and pedestrian accommodations on Cambridge Street, the roadway segments to be constructed south of Cambridge Street, and roadway connections to West Station;
- Bicycle and pedestrian connections from West Station south to Ashford Street;
- Construction of a shared-use pathway providing a more direct connection from the Cambridge Street/Lincoln Street area to the Charles River and the Paul Dudley White Bike Path, including a new bicycle/pedestrian bridge over SFR;



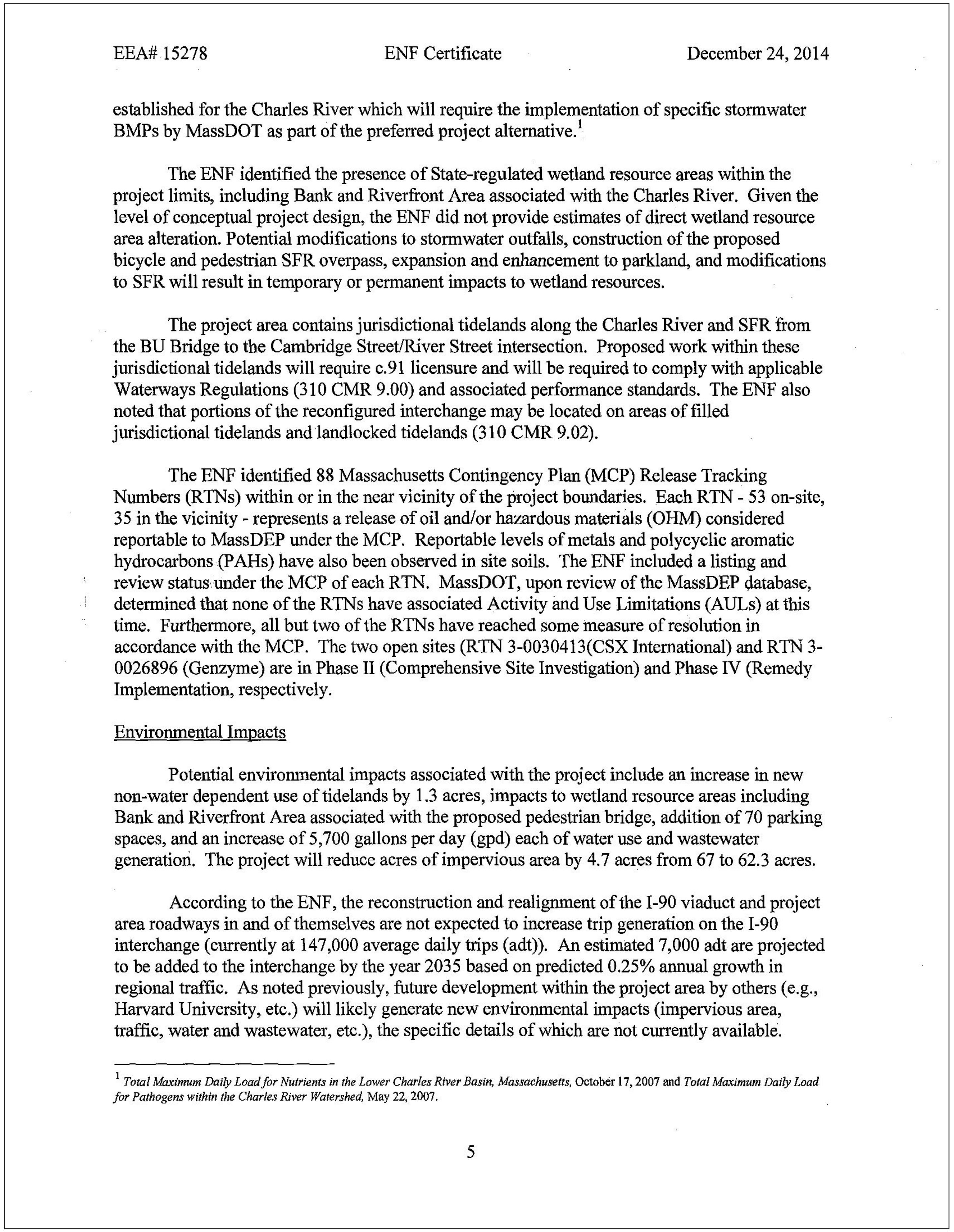
- Multi-modal access connections to West Station; and
- Improvements to the Lincoln Street pedestrian bridge across I-90 (immediately west of the Cambridge Street overpass) to meet Americans with Disabilities Act/Architectural Access Board (ADA/AAB) requirements. These upgrades are likely to require construction of retaining walls and may require private property takings to comply with ADA/AAB requirements.

Project Site

The approximately 150-acre project site includes the area encompassed by the former Beacon Park Yards (BPY) and bounded by Ashford Street to the south, the Commonwealth Avenue Bridge and Soldiers Field Road (SFR) to the east, and Cambridge Street to the north and west. The project limit to the west on I-90 includes the Lincoln Street pedestrian bridge over I-90. The project site includes the Framingham/Worcester branch of the Massachusetts Bay Transportation Authority (MBTA) commuter rail line, the Grand Junction Railroad and CSX facilities. According to the ENF, most of the land within the project area is presently owned by Harvard University. The I-90 interchange and railroad facilities operated by MassDOT and CSX Corporation (CSX) are located within easements. MassDOT and the MBTA will need to acquire from Harvard, easement rights over portions of the project site (in which Harvard will also have retained rights), in order to build the project. The remainder of the project site will remain unencumbered, Harvard-owned land.

The project area is bordered by the Charles River Basin Historic District and the Harvard Avenue Historic District, both of which are listed in the State and National Registers of Historic Places. The Charles River Basin Historic District includes, but is not limited to, SFR, the BU Bridge, the Grand Junction Railroad Bridge, and the River Street Bridge. The ENF also identified several properties included in the *Inventory of Historic and Archaeological Assets of the Commonwealth* that are near, but not within, the project area. There are no State Register-listed or recorded archaeological sites within the project area. The ENF noted that the project area has been heavily impacted by past highway, railway and utility construction, limiting the likelihood of intact archaeological resource on-site. The project will require review by the FHWA, the FTA, and the Army Corps of Engineers (ACOE) in compliance with Section 106 of the National Historic Preservation Act (36 CFR 800) and the National Environmental Policy Act (NEPA).

The project is located adjacent to the Charles River. Stormwater runoff from the project area received limited pre-treatment prior to discharge via culverts to the Charles River. The segment of the Charles River adjacent to the project area (Segment MA 72-36) is listed as an impaired water body in the *Final Massachusetts Year 2012 Integrated List or Waters* due to the following impairments: fish-passage barrier, Non-Native Aquatic Plants, Chlorophyll-a, Dichlorodiphenyltrichloroethane (DDT), *Escherichia coli* 1 (*E. coli*), Fishes Bioassessments, Nutrient/Eutrophication Biological Indicators, Oil and Grease, Dissolved Oxygen, polychlorinated biphenyl (PCB) in Fish Tissue, High pH, Total Phosphorus, Secchi disk transparency, Sediment Bioassays – Acute Toxicity Freshwater, and other flow regime alterations. Total Maximum Daily Loads (TMDLs) for nutrients and pathogens have been



established for the Charles River which will require the implementation of specific stormwater BMPs by MassDOT as part of the preferred project alternative.[1]

The ENF identified the presence of State-regulated wetland resource areas within the project limits, including Bank and Riverfront Area associated with the Charles River. Given the level of conceptual project design, the ENF did not provide estimates of direct wetland resource area alteration. Potential modifications to stormwater outfalls, construction of the proposed bicycle and pedestrian SFR overpass, expansion and enhancement to parkland, and modifications to SFR will result in temporary or permanent impacts to wetland resources.

The project area contains jurisdictional tidelands along the Charles River and SFR from the BU Bridge to the Cambridge Street/River Street intersection. Proposed work within these jurisdictional tidelands will require c.91 licensure and will be required to comply with applicable Waterways Regulations (310 CMR 9.00) and associated performance standards. The ENF also noted that portions of the reconfigured interchange may be located on areas of filled jurisdictional tidelands and landlocked tidelands (310 CMR 9.02).

The ENF identified 88 Massachusetts Contingency Plan (MCP) Release Tracking Numbers (RTNs) within or in the near vicinity of the project boundaries. Each RTN - 53 on-site, 35 in the vicinity - represents a release of oil and/or hazardous materials (OHM) considered reportable to MassDEP under the MCP. Reportable levels of metals and polycyclic aromatic hydrocarbons (PAHs) have also been observed in site soils. The ENF included a listing and review status under the MCP of each RTN. MassDOT, upon review of the MassDEP database, determined that none of the RTNs have associated Activity and Use Limitations (AULs) at this time. Furthermore, all but two of the RTNs have reached some measure of resolution in accordance with the MCP. The two open sites (RTN 3-0030413(CSX International) and RTN 3-0026896 (Genzyme) are in Phase II (Comprehensive Site Investigation) and Phase IV (Remedy Implementation, respectively.

Environmental Impacts

Potential environmental impacts associated with the project include an increase in new non-water dependent use of tidelands by 1.3 acres, impacts to wetland resource areas including Bank and Riverfront Area associated with the proposed pedestrian bridge, addition of 70 parking spaces, and an increase of 5,700 gallons per day (gpd) each of water use and wastewater generation. The project will reduce acres of impervious area by 4.7 acres from 67 to 62.3 acres.

According to the ENF, the reconstruction and realignment of the I-90 viaduct and project area roadways in and of themselves are not expected to increase trip generation on the I-90 interchange (currently at 147,000 average daily trips (adt)). An estimated 7,000 adt are projected to be added to the interchange by the year 2035 based on predicted 0.25% annual growth in regional traffic. As noted previously, future development within the project area by others (e.g., Harvard University, etc.) will likely generate new environmental impacts (impervious area, traffic, water and wastewater, etc.), the specific details of which are not currently available.

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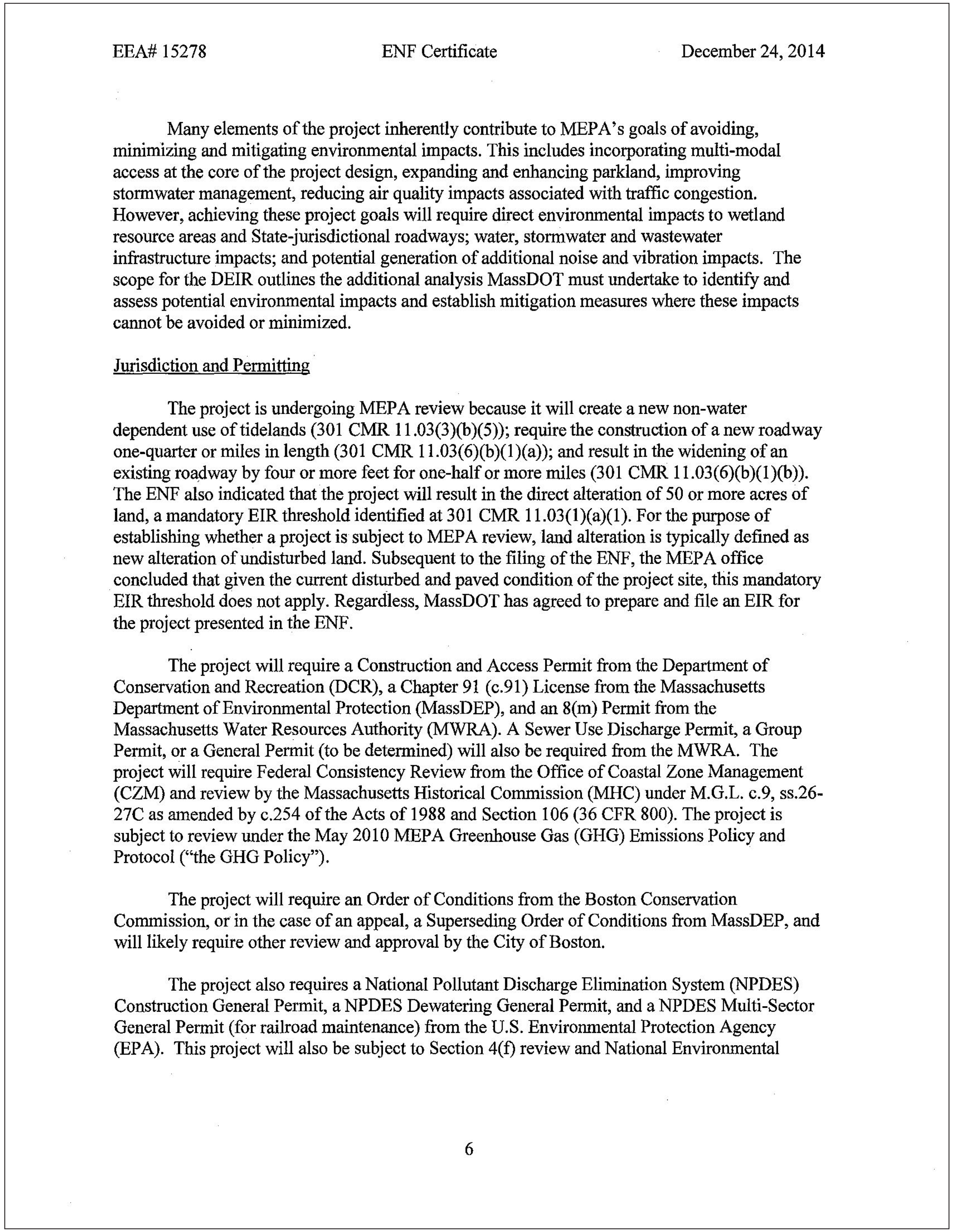
[1] *Total Maximum Daily Load for Nutrients in the Lower Charles River Basin, Massachusetts,* October 17, 2007 and *Total Maximum Daily Load for Pathogens within the Charles River Watershed,* May 22, 2007.



Many elements of the project inherently contribute to MEPA's goals of avoiding, minimizing and mitigating environmental impacts. This includes incorporating multi-modal access at the core of the project design, expanding and enhancing parkland, improving stormwater management, reducing air quality impacts associated with traffic congestion. However, achieving these project goals will require direct environmental impacts to wetland resource areas and State-jurisdictional roadways; water, stormwater and wastewater infrastructure impacts; and potential generation of additional noise and vibration impacts. The scope for the DEIR outlines the additional analysis MassDOT must undertake to identify and assess potential environmental impacts and establish mitigation measures where these impacts cannot be avoided or minimized.

Jurisdiction and Permitting

The project is undergoing MEPA review because it will create a new non-water dependent use of tidelands (301 CMR 11.03(3)(b)(5)); require the construction of a new roadway one-quarter or miles in length (301 CMR 11.03(6)(b)(1)(a)); and result in the widening of an existing roadway by four or more feet for one-half or more miles (301 CMR 11.03(6)(b)(1)(b)). The ENF also indicated that the project will result in the direct alteration of 50 or more acres of land, a mandatory EIR threshold identified at 301 CMR 11.03(1)(a)(1). For the purpose of establishing whether a project is subject to MEPA review, land alteration is typically defined as new alteration of undisturbed land. Subsequent to the filing of the ENF, the MEPA office concluded that given the current disturbed and paved condition of the project site, this mandatory EIR threshold does not apply. Regardless, MassDOT has agreed to prepare and file an EIR for the project presented in the ENF.

The project will require a Construction and Access Permit from the Department of Conservation and Recreation (DCR), a Chapter 91 (c.91) License from the Massachusetts Department of Environmental Protection (MassDEP), and an 8(m) Permit from the Massachusetts Water Resources Authority (MWRA). A Sewer Use Discharge Permit, a Group Permit, or a General Permit (to be determined) will also be required from the MWRA. The project will require Federal Consistency Review from the Office of Coastal Zone Management (CZM) and review by the Massachusetts Historical Commission (MHC) under M.G.L. c.9, ss.26-27C as amended by c.254 of the Acts of 1988 and Section 106 (36 CFR 800). The project is subject to review under the May 2010 MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol ("the GHG Policy").

The project will require an Order of Conditions from the Boston Conservation Commission, or in the case of an appeal, a Superseding Order of Conditions from MassDEP, and will likely require other review and approval by the City of Boston.

The project also requires a National Pollutant Discharge Elimination System (NPDES) Construction General Permit, a NPDES Dewatering General Permit, and a NPDES Multi-Sector General Permit (for railroad maintenance) from the U.S. Environmental Protection Agency (EPA). This project will also be subject to Section 4(f) review and National Environmental

Policy Act (NEPA) review by the Federal Highway Administration/Federal Transit Administration.

The project will be funded by Metropolitan Highway System (MHS) funds and other non-federal aid funding. Therefore, MEPA jurisdiction for this project is broad and extends to all aspects of the project that are likely, directly or indirectly, to cause Damage to the Environment as defined in the MEPA regulations.

Review of the ENF

A MEPA site walk at BPY and scoping session at Brighton High School were held the afternoon and evening of November 20, 2014. An extension of the 30 day comment period by two weeks was granted at the request of MassDOT, resulting in a comment period commencing upon notice in the Environmental Monitor on November 5, 2014 and concluding on December 15, 2014.

MassDOT convened a 50-member Task Force of residents, business owners, city officials, and other local stakeholders to build consensus about the project's conceptual design and assist in the review of interchange alternatives. The ENF included a list of Task Force members and their affiliations, the dates of the ten (10) meetings held to date, a link to meeting minutes posted online, and a summary of the key areas of concern or preferences voiced by the Task Force as part of the interchange design concept review process. Notable issues raised by the Task Force include:

- Overall emphasis on neighborhood cohesion;
- Integration and location of West Station into the project;
- Incorporation of a shared-use pathway providing a route from North Allston to the Charles River;
- Inclusion of bicycle and pedestrian connections throughout the project with connections to the Charles River, Cambridge, West Station and the BU area; and
- Defining the scale of Cambridge Street to create an urban streetscape.

Additional public outreach by MassDOT included two public informational meetings in Allston (April 10 and September 18) to present project details and solicit additional input. MassDOT also met with area stakeholder groups including the Boston Redevelopment Authority, the Boston Transportation Department (BTD), Harvard University, BU, Cambridge City Council, and the Cambridgeport Neighborhood Association.

The ENF described the project's consistency with the goals set forth in a number of MassDOT planning documents including: the Massachusetts Bicycle Transportation Plan (September 2008), the Massachusetts Pedestrian Transportation Plan (1998) and the Long Range Transportation Plan – Paths to a Sustainable Region (amendments through 2013).

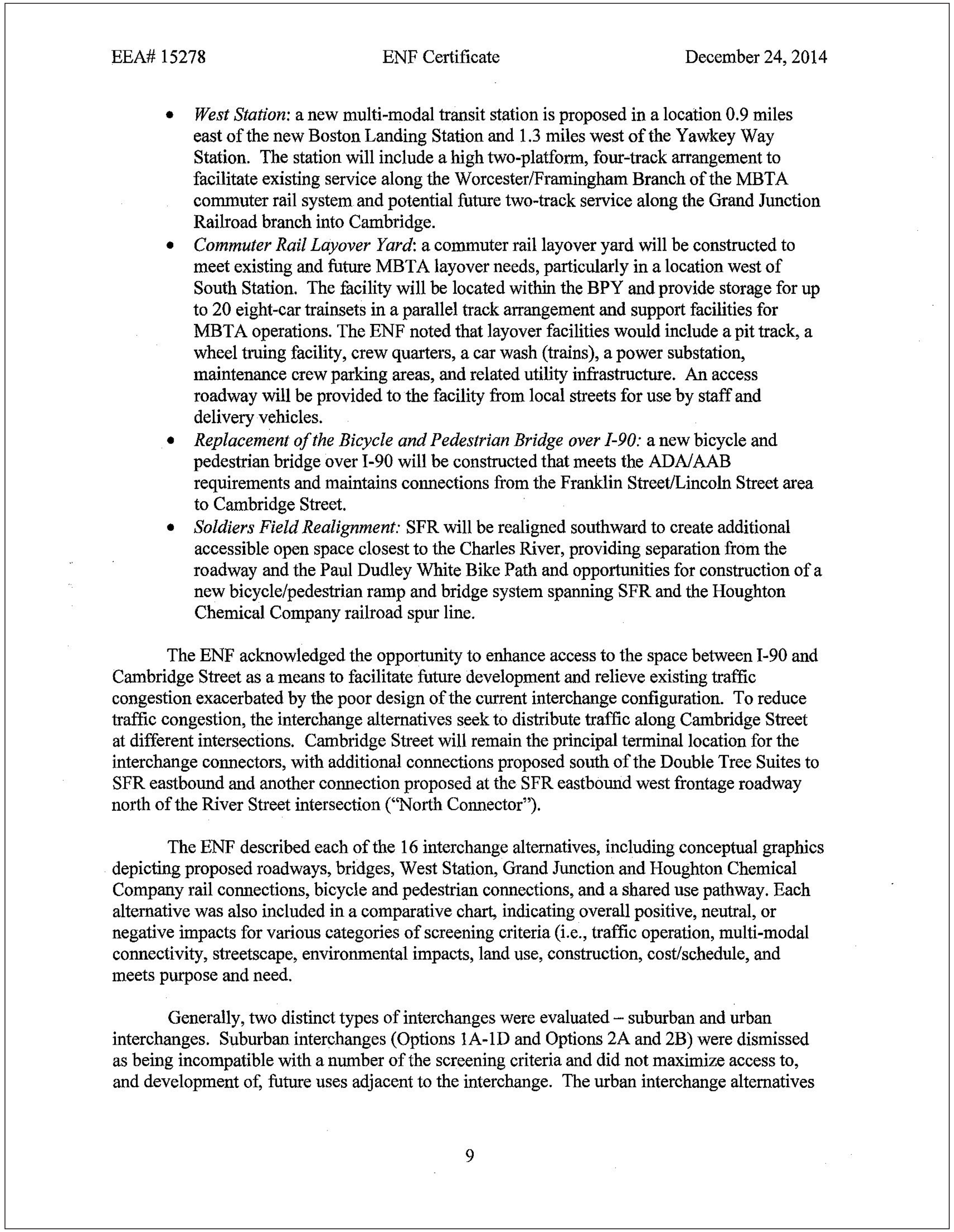
The current interchange does not meet interstate highway standards set by the American Association of State Highway Transportation Officials (AASHTO) guidelines. These deficiencies include a decrease in travel lanes within the interchange (four lanes to three), the

location of piers within narrow curbed medians, improperly designed exit ramps, insufficient acceleration and merging lengths, left-hand exits, and non-compliant shoulder widths and lateral offsets. The ENF described the current condition of the I-90 viaduct deck, superstructure, and substructure, noting its generally poor condition and indications of significant past repair and maintenance activities.

MassDOT has not identified a Preferred Alternative for the project. The ENF indentified a total of 16 conceptual interchange design alternatives considered by MassDOT and the Task Force. As part of the preliminary alternative analysis, alternative modes of travel (i.e., pedestrian, bicycle, transit) were incorporated into each alternative including features such as, but not limited to, cycle tracks, on-road bike lanes, access to West Station, and bus stop accommodations.

Each of the alternatives presented in the ENF include the following six components. Additional development and evaluation of these project elements will be required as part of the DEIR. These components included:

- *I-90 highway re-alignment*: upon removal of the toll booths, the highway will be realigned on a new, large radius curving to the south into the most northerly portion of the rail yard. Within the proposed interchange, between the initial exit ramp and the subsequent entrance ramp in both directions, I-90 will consist of three travel lanes in each direction and shoulders. One of the four travel lanes approaching the proposed interchange from each direction will be dropped at each of the two new exit ramps with the fourth lane in each direction added back to the interstate at the new entrance ramps. The I-90 median will consist of an inside shoulder in each direction, a concrete barrier with offsets on each side, and a capped median area between the two barriers reserved for construction of support structures to facilitate air-rights development.
- *I-90 Viaduct Reconstruction:* the viaduct will be completely removed and replaced with a new viaduct in approximately the same location. As presented in the ENF, this includes cantilevering a portion of the viaduct over SFR. From east to west, the new viaduct will begin at its current easterly abutment and will curve south to meet the proposed new alignment of I-90, ending at a new full-height abutment where the new I-90 profile will descend adjacent to the proposed commuter rail yard. In the ENF, MassDOT proposed increasing the viaduct width to accommodate inside shoulders, deceleration and acceleration lanes for the easternmost ramps on the new I-90 interchange and/or outside shoulders as a means to increase road safety. MassDOT has concluded that I-90 traffic must be maintained within the viaduct corridor during the construction period and cannot be detoured. A key factor associated with reconstructing the viaduct also includes maintaining existing railroad lines under the viaduct (two commuter rail lines, Grand Junction Railroad, and a spur line to Houghton Chemical Company) during and after construction. Maintaining these rail uses, the location of a large MWRA sewer interceptor on-site, and necessary grade transitions to the existing portions of I-90 beyond the viaduct led MassDOT to dismiss reconstructing I-90 at-grade or in a shallow tunnel due to unacceptable project risk, schedule impact, and implementation challenges.

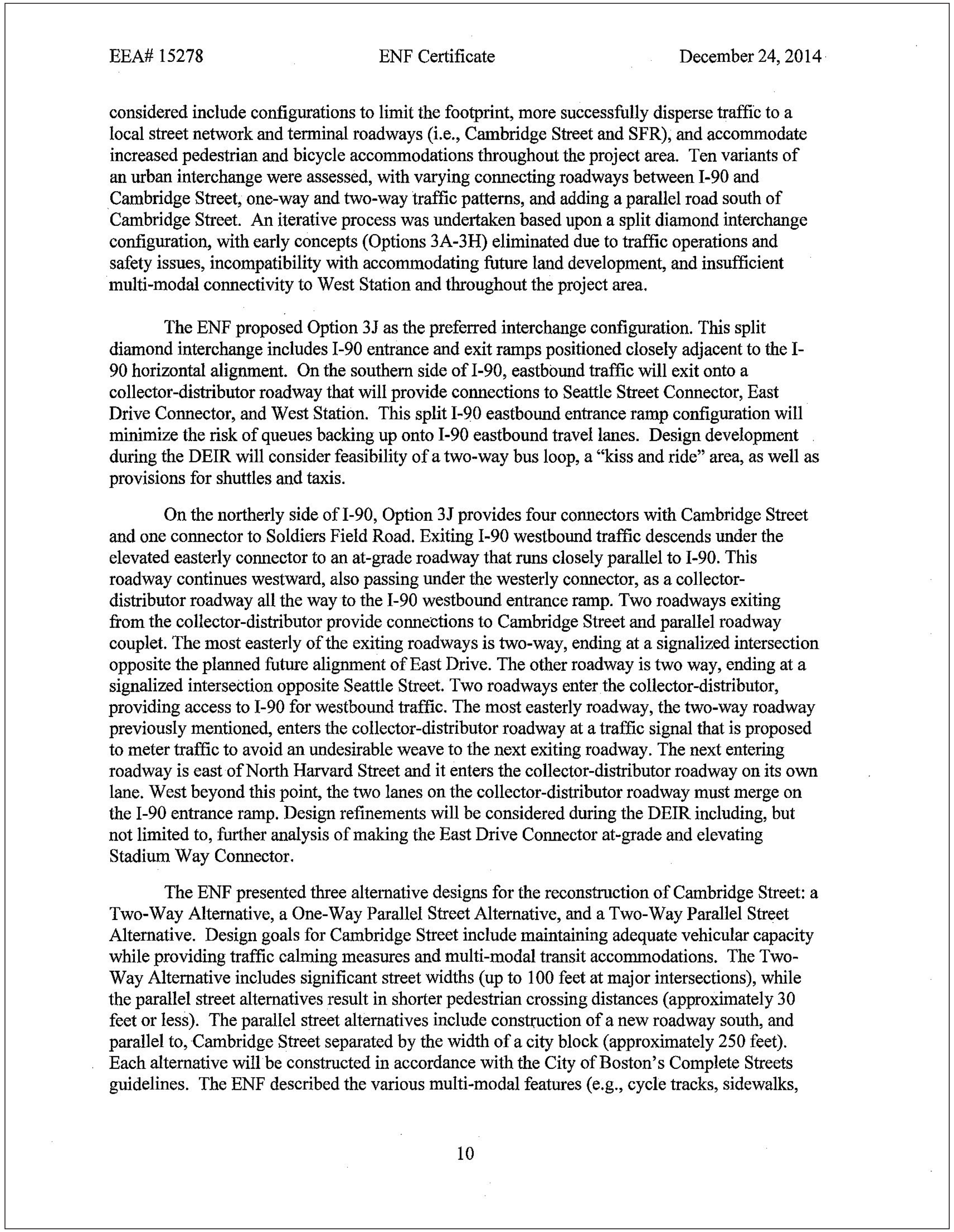


- *West Station*: a new multi-modal transit station is proposed in a location 0.9 miles east of the new Boston Landing Station and 1.3 miles west of the Yawkey Way Station. The station will include a high two-platform, four-track arrangement to facilitate existing service along the Worcester/Framingham Branch of the MBTA commuter rail system and potential future two-track service along the Grand Junction Railroad branch into Cambridge.
- *Commuter Rail Layover Yard*: a commuter rail layover yard will be constructed to meet existing and future MBTA layover needs, particularly in a location west of South Station. The facility will be located within the BPY and provide storage for up to 20 eight-car trainsets in a parallel track arrangement and support facilities for MBTA operations. The ENF noted that layover facilities would include a pit track, a wheel truing facility, crew quarters, a car wash (trains), a power substation, maintenance crew parking areas, and related utility infrastructure. An access roadway will be provided to the facility from local streets for use by staff and delivery vehicles.
- *Replacement of the Bicycle and Pedestrian Bridge over I-90:* a new bicycle and pedestrian bridge over I-90 will be constructed that meets the ADA/AAB requirements and maintains connections from the Franklin Street/Lincoln Street area to Cambridge Street.
- *Soldiers Field Realignment:* SFR will be realigned southward to create additional accessible open space closest to the Charles River, providing separation from the roadway and the Paul Dudley White Bike Path and opportunities for construction of a new bicycle/pedestrian ramp and bridge system spanning SFR and the Houghton Chemical Company railroad spur line.

The ENF acknowledged the opportunity to enhance access to the space between I-90 and Cambridge Street as a means to facilitate future development and relieve existing traffic congestion exacerbated by the poor design of the current interchange configuration. To reduce traffic congestion, the interchange alternatives seek to distribute traffic along Cambridge Street at different intersections. Cambridge Street will remain the principal terminal location for the interchange connectors, with additional connections proposed south of the Double Tree Suites to SFR eastbound and another connection proposed at the SFR eastbound west frontage roadway north of the River Street intersection ("North Connector").

The ENF described each of the 16 interchange alternatives, including conceptual graphics depicting proposed roadways, bridges, West Station, Grand Junction and Houghton Chemical Company rail connections, bicycle and pedestrian connections, and a shared use pathway. Each alternative was also included in a comparative chart, indicating overall positive, neutral, or negative impacts for various categories of screening criteria (i.e., traffic operation, multi-modal connectivity, streetscape, environmental impacts, land use, construction, cost/schedule, and meets purpose and need.

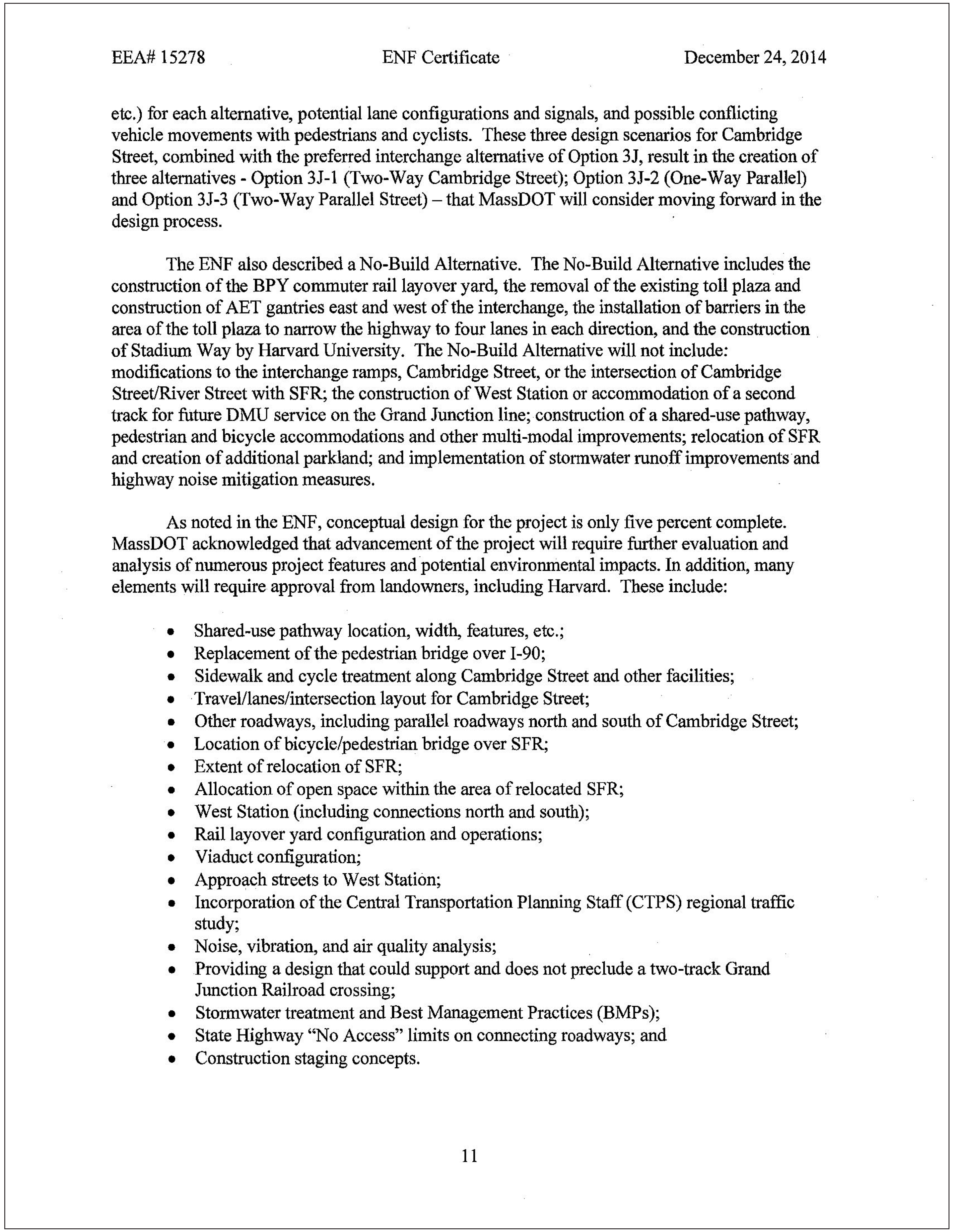
Generally, two distinct types of interchanges were evaluated – suburban and urban interchanges. Suburban interchanges (Options 1A-1D and Options 2A and 2B) were dismissed as being incompatible with a number of the screening criteria and did not maximize access to, and development of, future uses adjacent to the interchange. The urban interchange alternatives considered include configurations to limit the footprint, more successfully disperse traffic to a local street network and terminal roadways (i.e., Cambridge Street and SFR), and accommodate increased pedestrian and bicycle accommodations throughout the project area. Ten variants of an urban interchange were assessed, with varying connecting roadways between I-90 and Cambridge Street, one-way and two-way traffic patterns, and adding a parallel road south of Cambridge Street. An iterative process was undertaken based upon a split diamond interchange configuration, with early concepts (Options 3A-3H) eliminated due to traffic operations and safety issues, incompatibility with accommodating future land development, and insufficient multi-modal connectivity to West Station and throughout the project area.



The ENF proposed Option 3J as the preferred interchange configuration. This split diamond interchange includes I-90 entrance and exit ramps positioned closely adjacent to the I-90 horizontal alignment. On the southern side of I-90, eastbound traffic will exit onto a collector-distributor roadway that will provide connections to Seattle Street Connector, East Drive Connector, and West Station. This split I-90 eastbound entrance ramp configuration will minimize the risk of queues backing up onto I-90 eastbound travel lanes. Design development during the DEIR will consider feasibility of a two-way bus loop, a "kiss and ride" area, as well as provisions for shuttles and taxis.

On the northerly side of I-90, Option 3J provides four connectors with Cambridge Street and one connector to Soldiers Field Road. Exiting I-90 westbound traffic descends under the elevated easterly connector to an at-grade roadway that runs closely parallel to I-90. This roadway continues westward, also passing under the westerly connector, as a collector-distributor roadway all the way to the I-90 westbound entrance ramp. Two roadways exiting from the collector-distributor provide connections to Cambridge Street and parallel roadway couplet. The most easterly of the exiting roadways is two-way, ending at a signalized intersection opposite the planned future alignment of East Drive. The other roadway is two way, ending at a signalized intersection opposite Seattle Street. Two roadways enter the collector-distributor, providing access to I-90 for westbound traffic. The most easterly roadway, the two-way roadway previously mentioned, enters the collector-distributor roadway at a traffic signal that is proposed to meter traffic to avoid an undesirable weave to the next exiting roadway. The next entering roadway is east of North Harvard Street and it enters the collector-distributor roadway on its own lane. West beyond this point, the two lanes on the collector-distributor roadway must merge on the I-90 entrance ramp. Design refinements will be considered during the DEIR including, but not limited to, further analysis of making the East Drive Connector at-grade and elevating Stadium Way Connector.

The ENF presented three alternative designs for the reconstruction of Cambridge Street: a Two-Way Alternative, a One-Way Parallel Street Alternative, and a Two-Way Parallel Street Alternative. Design goals for Cambridge Street include maintaining adequate vehicular capacity while providing traffic calming measures and multi-modal transit accommodations. The Two-Way Alternative includes significant street widths (up to 100 feet at major intersections), while the parallel street alternatives result in shorter pedestrian crossing distances (approximately 30 feet or less). The parallel street alternatives include construction of a new roadway south, and parallel to, Cambridge Street separated by the width of a city block (approximately 250 feet). Each alternative will be constructed in accordance with the City of Boston's Complete Streets guidelines. The ENF described the various multi-modal features (e.g., cycle tracks, sidewalks,

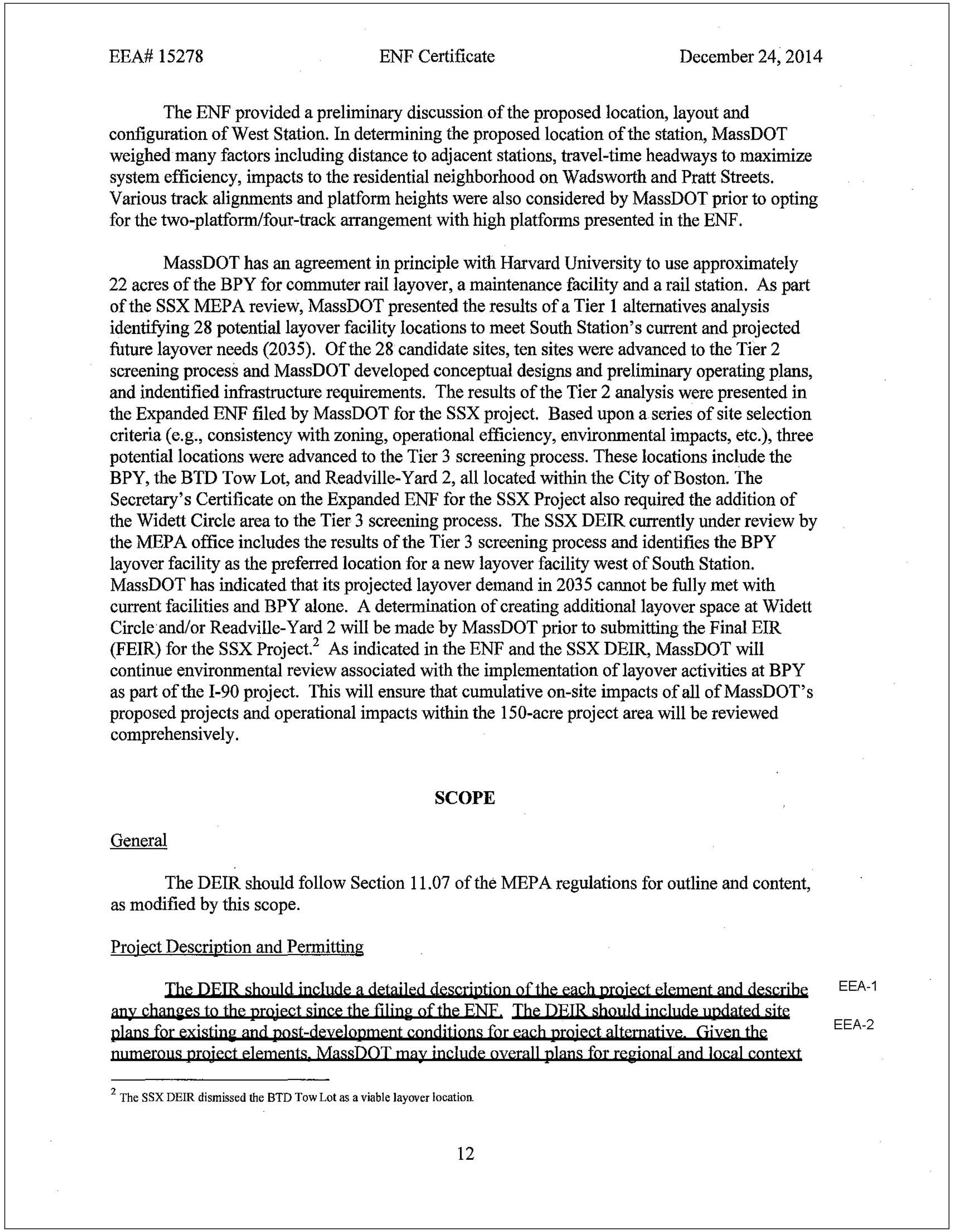


etc.) for each alternative, potential lane configurations and signals, and possible conflicting vehicle movements with pedestrians and cyclists. These three design scenarios for Cambridge Street, combined with the preferred interchange alternative of Option 3J, result in the creation of three alternatives - Option 3J-1 (Two-Way Cambridge Street); Option 3J-2 (One-Way Parallel) and Option 3J-3 (Two-Way Parallel Street) – that MassDOT will consider moving forward in the design process.

The ENF also described a No-Build Alternative. The No-Build Alternative includes the construction of the BPY commuter rail layover yard, the removal of the existing toll plaza and construction of AET gantries east and west of the interchange, the installation of barriers in the area of the toll plaza to narrow the highway to four lanes in each direction, and the construction of Stadium Way by Harvard University. The No-Build Alternative will not include: modifications to the interchange ramps, Cambridge Street, or the intersection of Cambridge Street/River Street with SFR; the construction of West Station or accommodation of a second track for future DMU service on the Grand Junction line; construction of a shared-use pathway, pedestrian and bicycle accommodations and other multi-modal improvements; relocation of SFR and creation of additional parkland; and implementation of stormwater runoff improvements and highway noise mitigation measures.

As noted in the ENF, conceptual design for the project is only five percent complete. MassDOT acknowledged that advancement of the project will require further evaluation and analysis of numerous project features and potential environmental impacts. In addition, many elements will require approval from landowners, including Harvard. These include:

- Shared-use pathway location, width, features, etc.;
- Replacement of the pedestrian bridge over I-90;
- Sidewalk and cycle treatment along Cambridge Street and other facilities;
- Travel/lanes/intersection layout for Cambridge Street;
- Other roadways, including parallel roadways north and south of Cambridge Street;
- Location of bicycle/pedestrian bridge over SFR;
- Extent of relocation of SFR;
- Allocation of open space within the area of relocated SFR;
- West Station (including connections north and south);
- Rail layover yard configuration and operations;
- Viaduct configuration;
- Approach streets to West Station;
- Incorporation of the Central Transportation Planning Staff (CTPS) regional traffic study;
- Noise, vibration, and air quality analysis;
- Providing a design that could support and does not preclude a two-track Grand Junction Railroad crossing;
- Stormwater treatment and Best Management Practices (BMPs);
- State Highway "No Access" limits on connecting roadways; and
- Construction staging concepts.



The ENF provided a preliminary discussion of the proposed location, layout and configuration of West Station. In determining the proposed location of the station, MassDOT weighed many factors including distance to adjacent stations, travel-time headways to maximize system efficiency, impacts to the residential neighborhood on Wadsworth and Pratt Streets. Various track alignments and platform heights were also considered by MassDOT prior to opting for the two-platform/four-track arrangement with high platforms presented in the ENF.

MassDOT has an agreement in principle with Harvard University to use approximately 22 acres of the BPY for commuter rail layover, a maintenance facility and a rail station. As part of the SSX MEPA review, MassDOT presented the results of a Tier 1 alternatives analysis identifying 28 potential layover facility locations to meet South Station's current and projected future layover needs (2035). Of the 28 candidate sites, ten sites were advanced to the Tier 2 screening process and MassDOT developed conceptual designs and preliminary operating plans, and indentified infrastructure requirements. The results of the Tier 2 analysis were presented in the Expanded ENF filed by MassDOT for the SSX project. Based upon a series of site selection criteria (e.g., consistency with zoning, operational efficiency, environmental impacts, etc.), three potential locations were advanced to the Tier 3 screening process. These locations include the BPY, the BTD Tow Lot, and Readville-Yard 2, all located within the City of Boston. The Secretary's Certificate on the Expanded ENF for the SSX Project also required the addition of the Widett Circle area to the Tier 3 screening process. The SSX DEIR currently under review by the MEPA office includes the results of the Tier 3 screening process and identifies the BPY layover facility as the preferred location for a new layover facility west of South Station. MassDOT has indicated that its projected layover demand in 2035 cannot be fully met with current facilities and BPY alone. A determination of creating additional layover space at Widett Circle and/or Readville-Yard 2 will be made by MassDOT prior to submitting the Final EIR (FEIR) for the SSX Project.[2] As indicated in the ENF and the SSX DEIR, MassDOT will continue environmental review associated with the implementation of layover activities at BPY as part of the I-90 project. This will ensure that cumulative on-site impacts of all of MassDOT's proposed projects and operational impacts within the 150-acre project area will be reviewed comprehensively.

SCOPE

General

The DEIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this scope.

Project Description and Permitting

The DEIR should include a detailed description of the each project element and describe any changes to the project since the filing of the ENF. The DEIR should include updated site plans for existing and post-development conditions for each project alternative. Given the numerous project elements, MassDOT may include overall plans for regional and local context EEA-1 EEA-2

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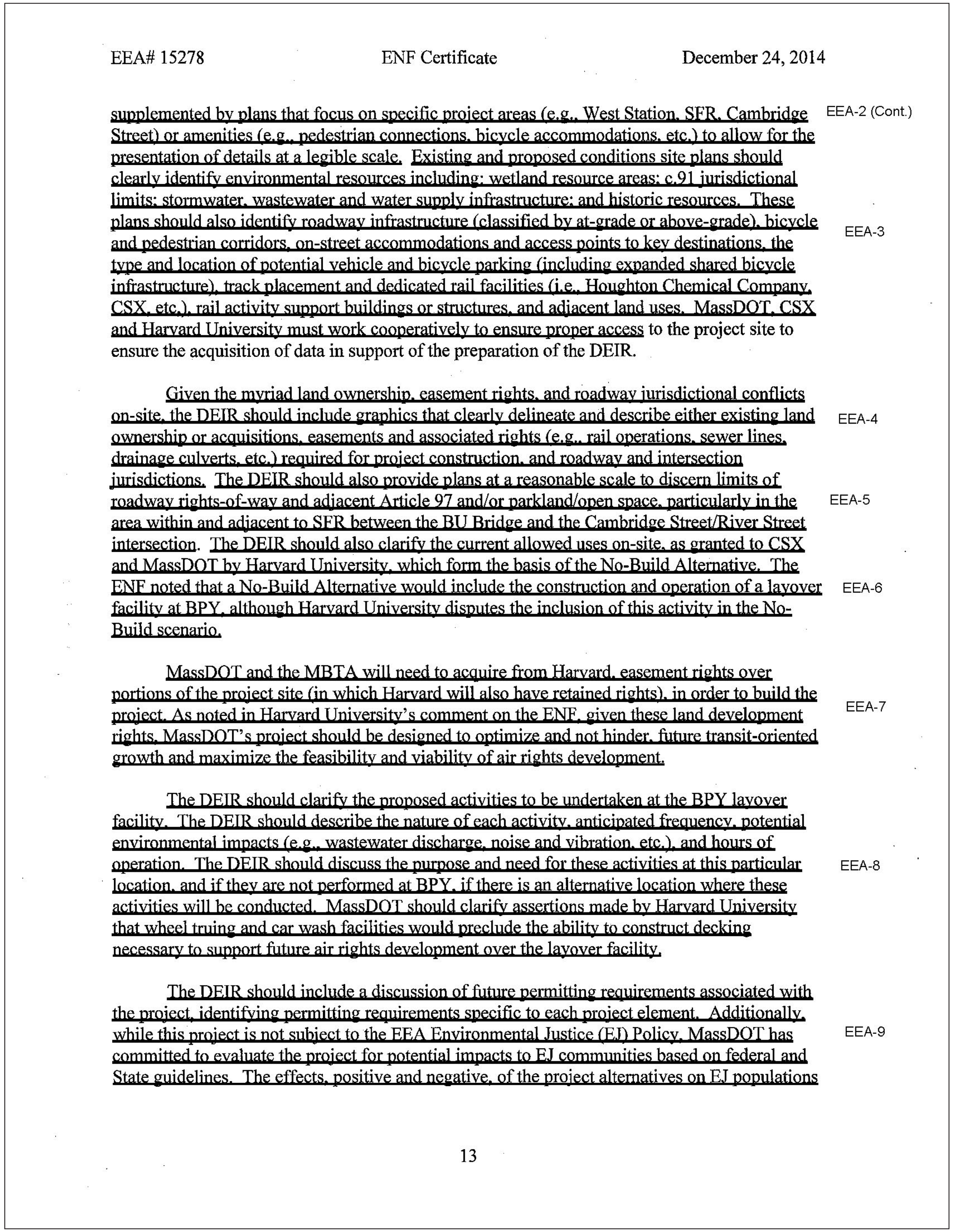
[2] The SSX DEIR dismissed the BTD Tow Lot as a viable layover location.



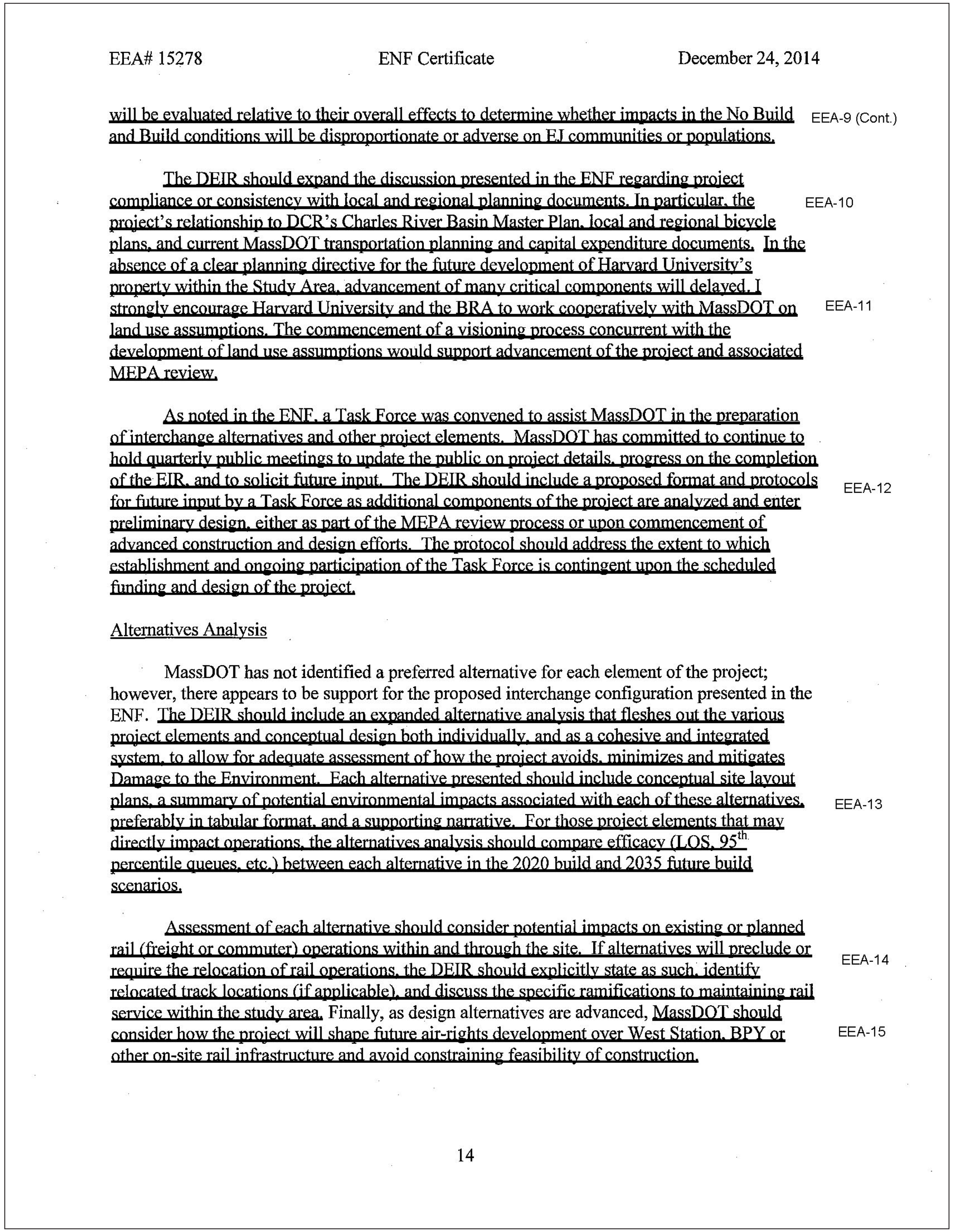
supplemented by plans that focus on specific project areas (e.g., West Station, SFR, Cambridge EEA-2 (Cont.)
Street) or amenities (e.g., pedestrian connections, bicycle accommodations, etc.) to allow for the
presentation of details at a legible scale. Existing and proposed conditions site plans should
clearly identify environmental resources including: wetland resource areas; c.91 jurisdictional
limits; stormwater, wastewater and water supply infrastructure; and historic resources. These
plans should also identify roadway infrastructure (classified by at-grade or above-grade), bicycle EEA-3
and pedestrian corridors, on-street accommodations and access points to key destinations, the
type and location of potential vehicle and bicycle parking (including expanded shared bicycle
infrastructure), track placement and dedicated rail facilities (i.e., Houghton Chemical Company,
CSX, etc.), rail activity support buildings or structures, and adjacent land uses. MassDOT, CSX
and Harvard University must work cooperatively to ensure proper access to the project site to
ensure the acquisition of data in support of the preparation of the DEIR.

Given the myriad land ownership, easement rights, and roadway jurisdictional conflicts
on-site, the DEIR should include graphics that clearly delineate and describe either existing land EEA-4
ownership or acquisitions, easements and associated rights (e.g., rail operations, sewer lines,
drainage culverts, etc.) required for project construction, and roadway and intersection
jurisdictions. The DEIR should also provide plans at a reasonable scale to discern limits of
roadway rights-of-way and adjacent Article 97 and/or parkland/open space, particularly in the EEA-5
area within and adjacent to SFR between the BU Bridge and the Cambridge Street/River Street
intersection. The DEIR should also clarify the current allowed uses on-site, as granted to CSX
and MassDOT by Harvard University, which form the basis of the No-Build Alternative. The
ENF noted that a No-Build Alternative would include the construction and operation of a layover EEA-6
facility at BPY, although Harvard University disputes the inclusion of this activity in the No-
Build scenario.

MassDOT and the MBTA will need to acquire from Harvard, easement rights over
portions of the project site (in which Harvard will also have retained rights), in order to build the
project. As noted in Harvard University's comment on the ENF, given these land development EEA-7
rights, MassDOT's project should be designed to optimize and not hinder, future transit-oriented
growth and maximize the feasibility and viability of air rights development.

The DEIR should clarify the proposed activities to be undertaken at the BPY layover
facility. The DEIR should describe the nature of each activity, anticipated frequency, potential
environmental impacts (e.g., wastewater discharge, noise and vibration, etc.), and hours of
operation. The DEIR should discuss the purpose and need for these activities at this particular EEA-8
location, and if they are not performed at BPY, if there is an alternative location where these
activities will be conducted. MassDOT should clarify assertions made by Harvard University
that wheel truing and car wash facilities would preclude the ability to construct decking
necessary to support future air rights development over the layover facility.

The DEIR should include a discussion of future permitting requirements associated with
the project, identifying permitting requirements specific to each project element. Additionally,
while this project is not subject to the EEA Environmental Justice (EJ) Policy, MassDOT has EEA-9
committed to evaluate the project for potential impacts to EJ communities based on federal and
State guidelines. The effects, positive and negative, of the project alternatives on EJ populations



will be evaluated relative to their overall effects to determine whether impacts in the No Build EEA-9 (Cont.)
and Build conditions will be disproportionate or adverse on EJ communities or populations.

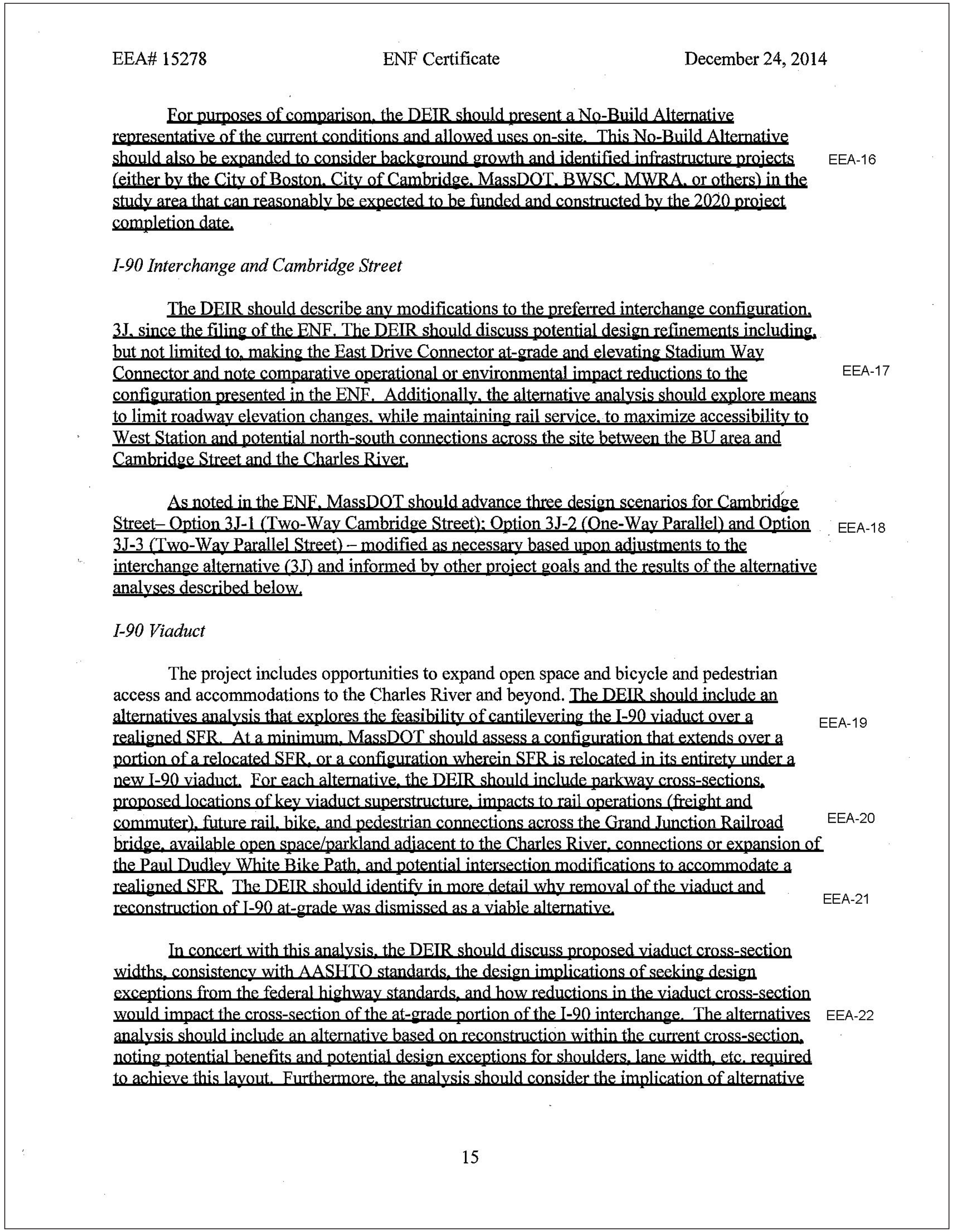
The DEIR should expand the discussion presented in the ENF regarding project
compliance or consistency with local and regional planning documents. In particular, the EEA-10
project's relationship to DCR's Charles River Basin Master Plan, local and regional bicycle
plans, and current MassDOT transportation planning and capital expenditure documents. In the
absence of a clear planning directive for the future development of Harvard University's
property within the Study Area, advancement of many critical components will delayed. I
strongly encourage Harvard University and the BRA to work cooperatively with MassDOT on EEA-11
land use assumptions. The commencement of a visioning process concurrent with the
development of land use assumptions would support advancement of the project and associated
MEPA review.

As noted in the ENF, a Task Force was convened to assist MassDOT in the preparation
of interchange alternatives and other project elements. MassDOT has committed to continue to
hold quarterly public meetings to update the public on project details, progress on the completion
of the EIR, and to solicit future input. The DEIR should include a proposed format and protocols EEA-12
for future input by a Task Force as additional components of the project are analyzed and enter
preliminary design, either as part of the MEPA review process or upon commencement of
advanced construction and design efforts. The protocol should address the extent to which
establishment and ongoing participation of the Task Force is contingent upon the scheduled
funding and design of the project.

Alternatives Analysis

MassDOT has not identified a preferred alternative for each element of the project;
however, there appears to be support for the proposed interchange configuration presented in the
ENF. The DEIR should include an expanded alternative analysis that fleshes out the various
project elements and conceptual design both individually, and as a cohesive and integrated
system, to allow for adequate assessment of how the project avoids, minimizes and mitigates
Damage to the Environment. Each alternative presented should include conceptual site layout
plans, a summary of potential environmental impacts associated with each of these alternatives, EEA-13
preferably in tabular format, and a supporting narrative. For those project elements that may
directly impact operations, the alternatives analysis should compare efficacy (LOS, 95th
percentile queues, etc.) between each alternative in the 2020 build and 2035 future build
scenarios.

Assessment of each alternative should consider potential impacts on existing or planned
rail (freight or commuter) operations within and through the site. If alternatives will preclude or EEA-14
require the relocation of rail operations, the DEIR should explicitly state as such, identify
relocated track locations (if applicable), and discuss the specific ramifications to maintaining rail
service within the study area. Finally, as design alternatives are advanced, MassDOT should
consider how the project will shape future air-rights development over West Station, BPY or EEA-15
other on-site rail infrastructure and avoid constraining feasibility of construction.



For purposes of comparison, the DEIR should present a No-Build Alternative representative of the current conditions and allowed uses on-site. This No-Build Alternative should also be expanded to consider background growth and identified infrastructure projects (either by the City of Boston, City of Cambridge, MassDOT, BWSC, MWRA, or others) in the study area that can reasonably be expected to be funded and constructed by the 2020 project completion date. EEA-16

I-90 Interchange and Cambridge Street

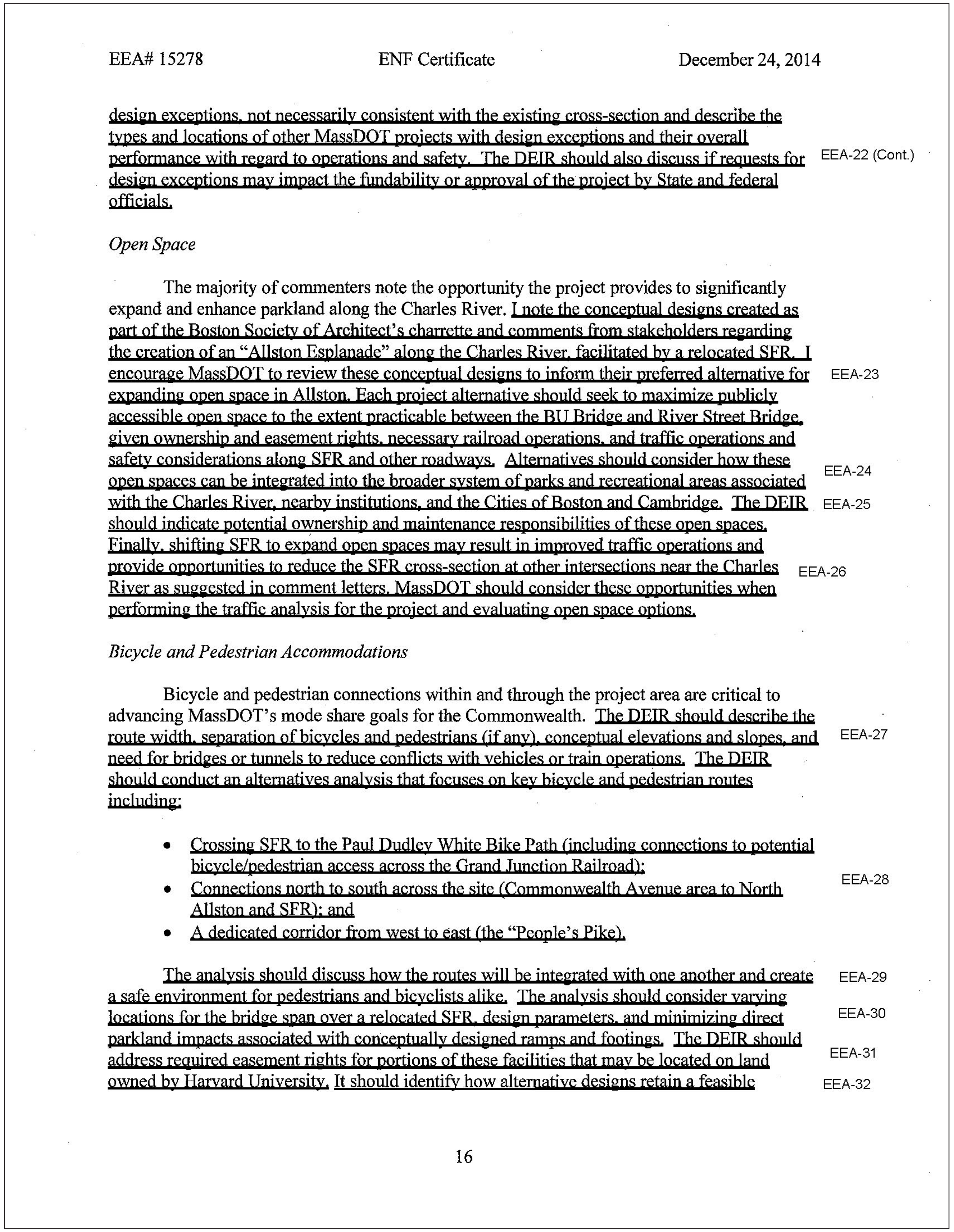
The DEIR should describe any modifications to the preferred interchange configuration, 3J, since the filing of the ENF. The DEIR should discuss potential design refinements including, but not limited to, making the East Drive Connector at-grade and elevating Stadium Way Connector and note comparative operational or environmental impact reductions to the configuration presented in the ENF. Additionally, the alternative analysis should explore means to limit roadway elevation changes, while maintaining rail service, to maximize accessibility to West Station and potential north-south connections across the site between the BU area and Cambridge Street and the Charles River. EEA-17

As noted in the ENF, MassDOT should advance three design scenarios for Cambridge Street– Option 3J-1 (Two-Way Cambridge Street); Option 3J-2 (One-Way Parallel) and Option 3J-3 (Two-Way Parallel Street) – modified as necessary based upon adjustments to the interchange alternative (3J) and informed by other project goals and the results of the alternative analyses described below. EEA-18

I-90 Viaduct

The project includes opportunities to expand open space and bicycle and pedestrian access and accommodations to the Charles River and beyond. The DEIR should include an alternatives analysis that explores the feasibility of cantilevering the I-90 viaduct over a realigned SFR. At a minimum, MassDOT should assess a configuration that extends over a portion of a relocated SFR, or a configuration wherein SFR is relocated in its entirety under a new I-90 viaduct. EEA-19 For each alternative, the DEIR should include parkway cross-sections, proposed locations of key viaduct superstructure, impacts to rail operations (freight and commuter), future rail, bike, and pedestrian connections across the Grand Junction Railroad bridge, available open space/parkland adjacent to the Charles River, connections or expansion of the Paul Dudley White Bike Path, and potential intersection modifications to accommodate a realigned SFR. EEA-20 The DEIR should identify in more detail why removal of the viaduct and reconstruction of I-90 at-grade was dismissed as a viable alternative. EEA-21

In concert with this analysis, the DEIR should discuss proposed viaduct cross-section widths, consistency with AASHTO standards, the design implications of seeking design exceptions from the federal highway standards, and how reductions in the viaduct cross-section would impact the cross-section of the at-grade portion of the I-90 interchange. The alternatives analysis should include an alternative based on reconstruction within the current cross-section, noting potential benefits and potential design exceptions for shoulders, lane width, etc. required to achieve this layout. Furthermore, the analysis should consider the implication of alternative EEA-22



design exceptions, not necessarily consistent with the existing cross-section and describe the types and locations of other MassDOT projects with design exceptions and their overall performance with regard to operations and safety. The DEIR should also discuss if requests for design exceptions may impact the fundability or approval of the project by State and federal officials. EEA-22 (Cont.)

Open Space

The majority of commenters note the opportunity the project provides to significantly expand and enhance parkland along the Charles River. I note the conceptual designs created as part of the Boston Society of Architect's charrette and comments from stakeholders regarding the creation of an "Allston Esplanade" along the Charles River, facilitated by a relocated SFR. I encourage MassDOT to review these conceptual designs to inform their preferred alternative for expanding open space in Allston. Each project alternative should seek to maximize publicly accessible open space to the extent practicable between the BU Bridge and River Street Bridge, given ownership and easement rights, necessary railroad operations, and traffic operations and safety considerations along SFR and other roadways. EEA-23 Alternatives should consider how these open spaces can be integrated into the broader system of parks and recreational areas associated with the Charles River, nearby institutions, and the Cities of Boston and Cambridge. EEA-24 The DEIR should indicate potential ownership and maintenance responsibilities of these open spaces. EEA-25 Finally, shifting SFR to expand open spaces may result in improved traffic operations and provide opportunities to reduce the SFR cross-section at other intersections near the Charles River as suggested in comment letters. MassDOT should consider these opportunities when performing the traffic analysis for the project and evaluating open space options. EEA-26

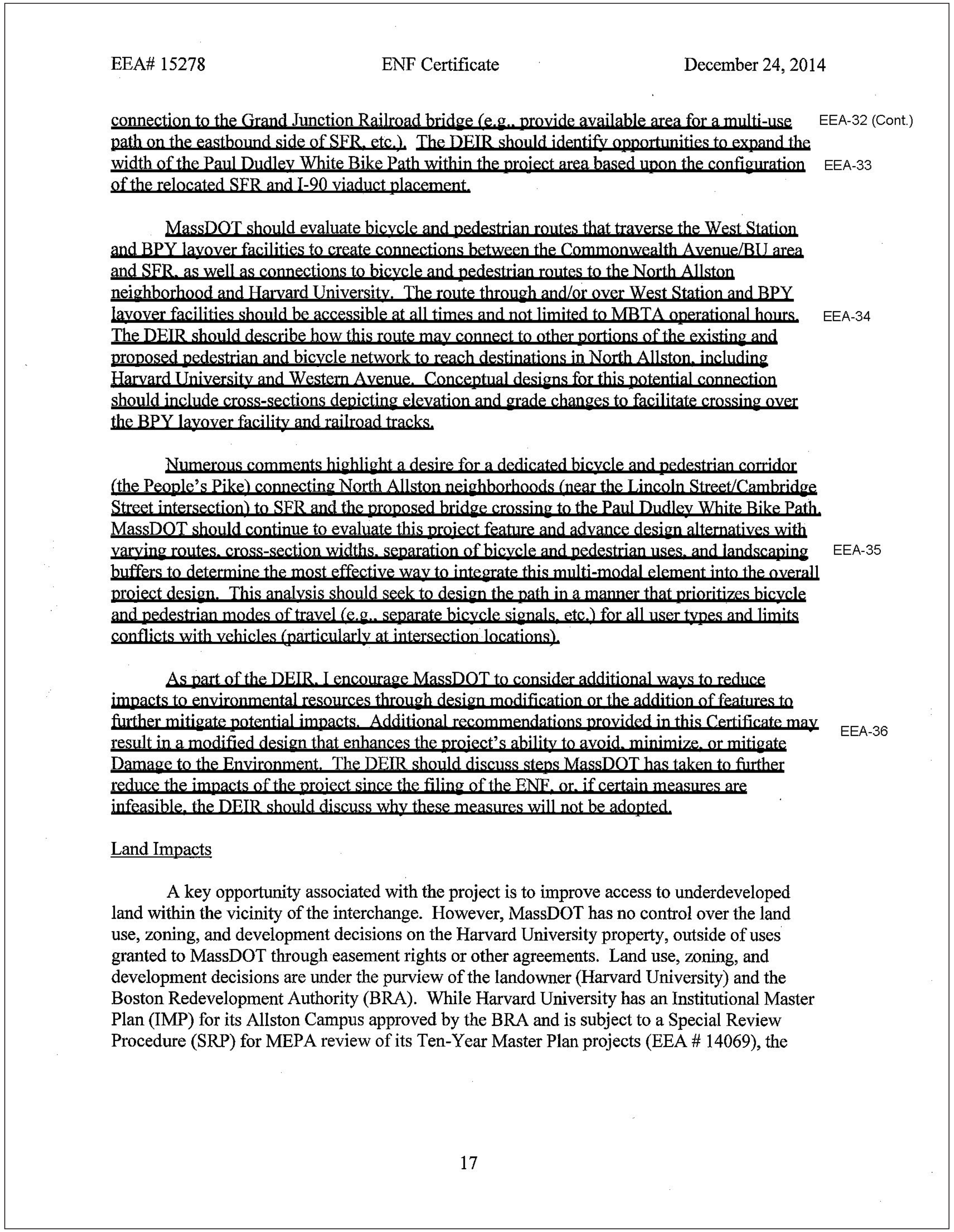
Bicycle and Pedestrian Accommodations

Bicycle and pedestrian connections within and through the project area are critical to advancing MassDOT's mode share goals for the Commonwealth. The DEIR should describe the route width, separation of bicycles and pedestrians (if any), conceptual elevations and slopes, and need for bridges or tunnels to reduce conflicts with vehicles or train operations. EEA-27 The DEIR should conduct an alternatives analysis that focuses on key bicycle and pedestrian routes including:

- Crossing SFR to the Paul Dudley White Bike Path (including connections to potential bicycle/pedestrian access across the Grand Junction Railroad);
- Connections north to south across the site (Commonwealth Avenue area to North Allston and SFR); and
- A dedicated corridor from west to east (the "People's Pike).

EEA-28

The analysis should discuss how the routes will be integrated with one another and create a safe environment for pedestrians and bicyclists alike. EEA-29 The analysis should consider varying locations for the bridge span over a relocated SFR, design parameters, and minimizing direct parkland impacts associated with conceptually designed ramps and footings. EEA-30 The DEIR should address required easement rights for portions of these facilities that may be located on land owned by Harvard University. EEA-31 It should identify how alternative designs retain a feasible EEA-32



connection to the Grand Junction Railroad bridge (e.g., provide available area for a multi-use path on the eastbound side of SFR, etc.). The DEIR should identify opportunities to expand the width of the Paul Dudley White Bike Path within the project area based upon the configuration of the relocated SFR and I-90 viaduct placement.

EEA-32 (Cont.)
EEA-33

MassDOT should evaluate bicycle and pedestrian routes that traverse the West Station and BPY layover facilities to create connections between the Commonwealth Avenue/BU area and SFR, as well as connections to bicycle and pedestrian routes to the North Allston neighborhood and Harvard University. The route through and/or over West Station and BPY layover facilities should be accessible at all times and not limited to MBTA operational hours. The DEIR should describe how this route may connect to other portions of the existing and proposed pedestrian and bicycle network to reach destinations in North Allston, including Harvard University and Western Avenue. Conceptual designs for this potential connection should include cross-sections depicting elevation and grade changes to facilitate crossing over the BPY layover facility and railroad tracks.

EEA-34

Numerous comments highlight a desire for a dedicated bicycle and pedestrian corridor (the People's Pike) connecting North Allston neighborhoods (near the Lincoln Street/Cambridge Street intersection) to SFR and the proposed bridge crossing to the Paul Dudley White Bike Path. MassDOT should continue to evaluate this project feature and advance design alternatives with varying routes, cross-section widths, separation of bicycle and pedestrian uses, and landscaping buffers to determine the most effective way to integrate this multi-modal element into the overall project design. This analysis should seek to design the path in a manner that prioritizes bicycle and pedestrian modes of travel (e.g., separate bicycle signals, etc.) for all user types and limits conflicts with vehicles (particularly at intersection locations).

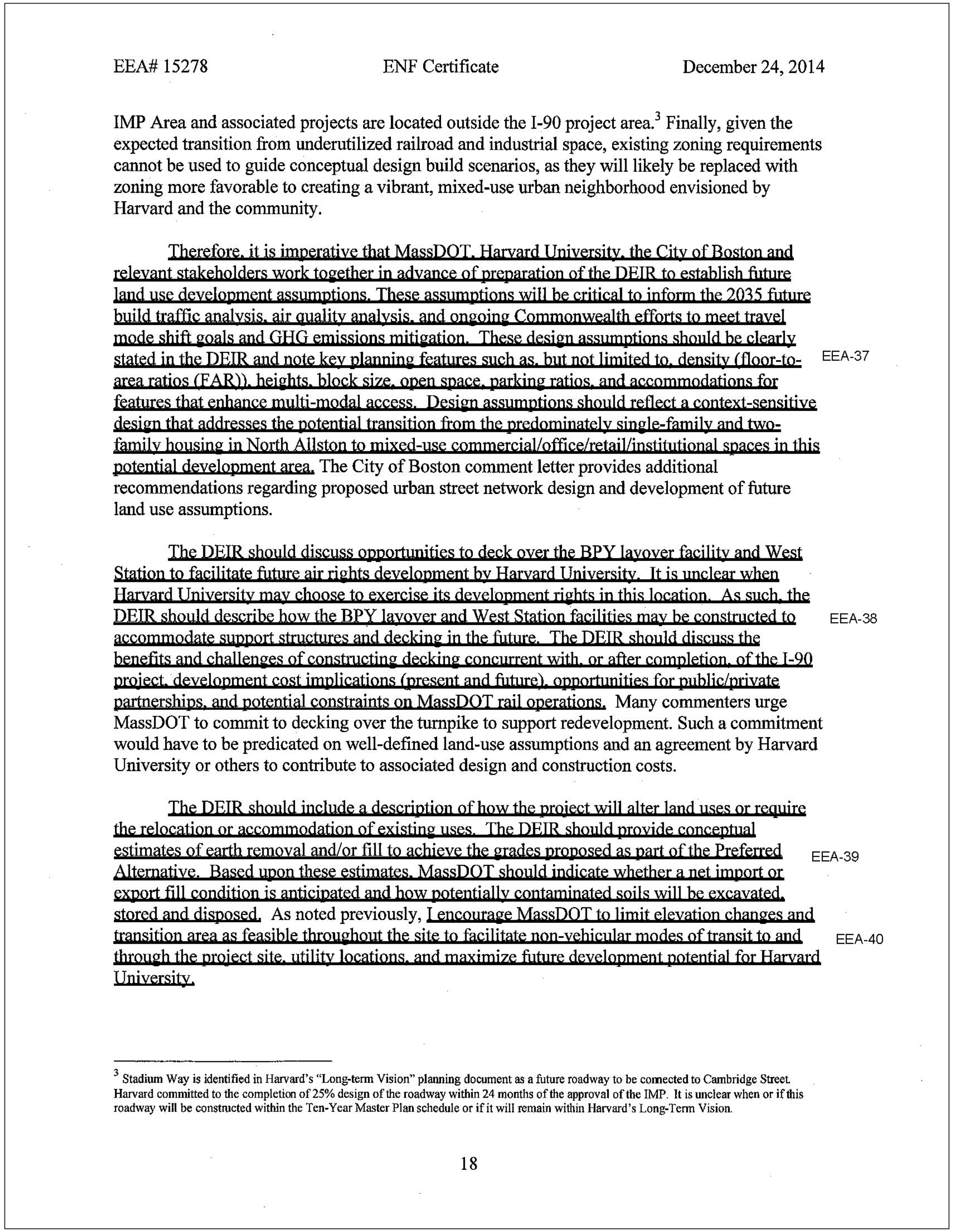
EEA-35

As part of the DEIR, I encourage MassDOT to consider additional ways to reduce impacts to environmental resources through design modification or the addition of features to further mitigate potential impacts. Additional recommendations provided in this Certificate may result in a modified design that enhances the project's ability to avoid, minimize, or mitigate Damage to the Environment. The DEIR should discuss steps MassDOT has taken to further reduce the impacts of the project since the filing of the ENF, or, if certain measures are infeasible, the DEIR should discuss why these measures will not be adopted.

EEA-36

Land Impacts

A key opportunity associated with the project is to improve access to underdeveloped land within the vicinity of the interchange. However, MassDOT has no control over the land use, zoning, and development decisions on the Harvard University property, outside of uses granted to MassDOT through easement rights or other agreements. Land use, zoning, and development decisions are under the purview of the landowner (Harvard University) and the Boston Redevelopment Authority (BRA). While Harvard University has an Institutional Master Plan (IMP) for its Allston Campus approved by the BRA and is subject to a Special Review Procedure (SRP) for MEPA review of its Ten-Year Master Plan projects (EEA # 14069), the



IMP Area and associated projects are located outside the I-90 project area.[3] Finally, given the expected transition from underutilized railroad and industrial space, existing zoning requirements cannot be used to guide conceptual design build scenarios, as they will likely be replaced with zoning more favorable to creating a vibrant, mixed-use urban neighborhood envisioned by Harvard and the community.

Therefore, it is imperative that MassDOT, Harvard University, the City of Boston and relevant stakeholders work together in advance of preparation of the DEIR to establish future land use development assumptions. These assumptions will be critical to inform the 2035 future build traffic analysis, air quality analysis, and ongoing Commonwealth efforts to meet travel mode shift goals and GHG emissions mitigation. These design assumptions should be clearly stated in the DEIR and note key planning features such as, but not limited to, density (floor-to-area ratios (FAR)), heights, block size, open space, parking ratios, and accommodations for features that enhance multi-modal access. Design assumptions should reflect a context-sensitive design that addresses the potential transition from the predominately single-family and two-family housing in North Allston to mixed-use commercial/office/retail/institutional spaces in this potential development area. The City of Boston comment letter provides additional recommendations regarding proposed urban street network design and development of future land use assumptions.

EEA-37

The DEIR should discuss opportunities to deck over the BPY layover facility and West Station to facilitate future air rights development by Harvard University. It is unclear when Harvard University may choose to exercise its development rights in this location. As such, the DEIR should describe how the BPY layover and West Station facilities may be constructed to accommodate support structures and decking in the future. The DEIR should discuss the benefits and challenges of constructing decking concurrent with, or after completion, of the I-90 project, development cost implications (present and future), opportunities for public/private partnerships, and potential constraints on MassDOT rail operations. Many commenters urge MassDOT to commit to decking over the turnpike to support redevelopment. Such a commitment would have to be predicated on well-defined land-use assumptions and an agreement by Harvard University or others to contribute to associated design and construction costs.

EEA-38

The DEIR should include a description of how the project will alter land uses or require the relocation or accommodation of existing uses. The DEIR should provide conceptual estimates of earth removal and/or fill to achieve the grades proposed as part of the Preferred Alternative. Based upon these estimates, MassDOT should indicate whether a net import or export fill condition is anticipated and how potentially contaminated soils will be excavated, stored and disposed. As noted previously, I encourage MassDOT to limit elevation changes and transition area as feasible throughout the site to facilitate non-vehicular modes of transit to and through the project site, utility locations, and maximize future development potential for Harvard University.

EEA-39
EEA-40

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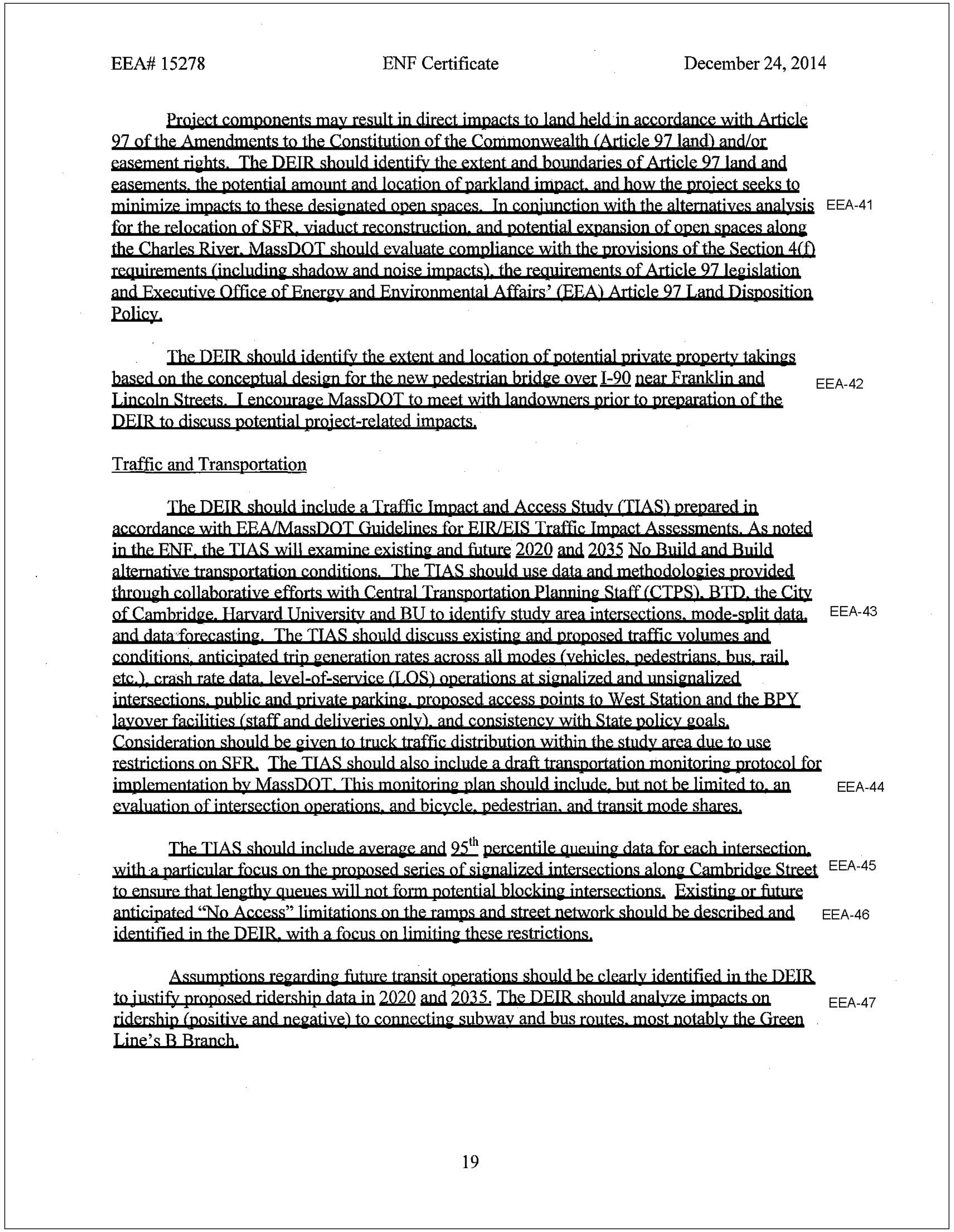
[3] Stadium Way is identified in Harvard's "Long-term Vision" planning document as a future roadway to be connected to Cambridge Street. Harvard committed to the completion of 25% design of the roadway within 24 months of the approval of the IMP. It is unclear when or if this roadway will be constructed within the Ten-Year Master Plan schedule or if it will remain within Harvard's Long-Term Vision.



EEA# 15278 ENF Certificate December 24, 2014

Project components may result in direct impacts to land held in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth (Article 97 land) and/or easement rights. The DEIR should identify the extent and boundaries of Article 97 land and easements, the potential amount and location of parkland impact, and how the project seeks to minimize impacts to these designated open spaces. EEA-41 In conjunction with the alternatives analysis for the relocation of SFR, viaduct reconstruction, and potential expansion of open spaces along the Charles River, MassDOT should evaluate compliance with the provisions of the Section 4(f) requirements (including shadow and noise impacts), the requirements of Article 97 legislation and Executive Office of Energy and Environmental Affairs' (EEA) Article 97 Land Disposition Policy.

The DEIR should identify the extent and location of potential private property takings based on the conceptual design for the new pedestrian bridge over I-90 near Franklin and Lincoln Streets. EEA-42 I encourage MassDOT to meet with landowners prior to preparation of the DEIR to discuss potential project-related impacts.

Traffic and Transportation

The DEIR should include a Traffic Impact and Access Study (TIAS) prepared in accordance with EEA/MassDOT Guidelines for EIR/EIS Traffic Impact Assessments. As noted in the ENF, the TIAS will examine existing and future 2020 and 2035 No Build and Build alternative transportation conditions. The TIAS should use data and methodologies provided through collaborative efforts with Central Transportation Planning Staff (CTPS), BTD, the City of Cambridge, Harvard University and BU to identify study area intersections, mode-split data, EEA-43 and data forecasting. The TIAS should discuss existing and proposed traffic volumes and conditions, anticipated trip generation rates across all modes (vehicles, pedestrians, bus, rail, etc.), crash rate data, level-of-service (LOS) operations at signalized and unsignalized intersections, public and private parking, proposed access points to West Station and the BPY layover facilities (staff and deliveries only), and consistency with State policy goals. Consideration should be given to truck traffic distribution within the study area due to use restrictions on SFR. The TIAS should also include a draft transportation monitoring protocol for implementation by MassDOT. EEA-44 This monitoring plan should include, but not be limited to, an evaluation of intersection operations, and bicycle, pedestrian, and transit mode shares.

The TIAS should include average and 95th percentile queuing data for each intersection, EEA-45 with a particular focus on the proposed series of signalized intersections along Cambridge Street to ensure that lengthy queues will not form potential blocking intersections. Existing or future anticipated "No Access" limitations on the ramps and street network should be described and EEA-46 identified in the DEIR, with a focus on limiting these restrictions.

Assumptions regarding future transit operations should be clearly identified in the DEIR to justify proposed ridership data in 2020 and 2035. EEA-47 The DEIR should analyze impacts on ridership (positive and negative) to connecting subway and bus routes, most notably the Green Line's B Branch.

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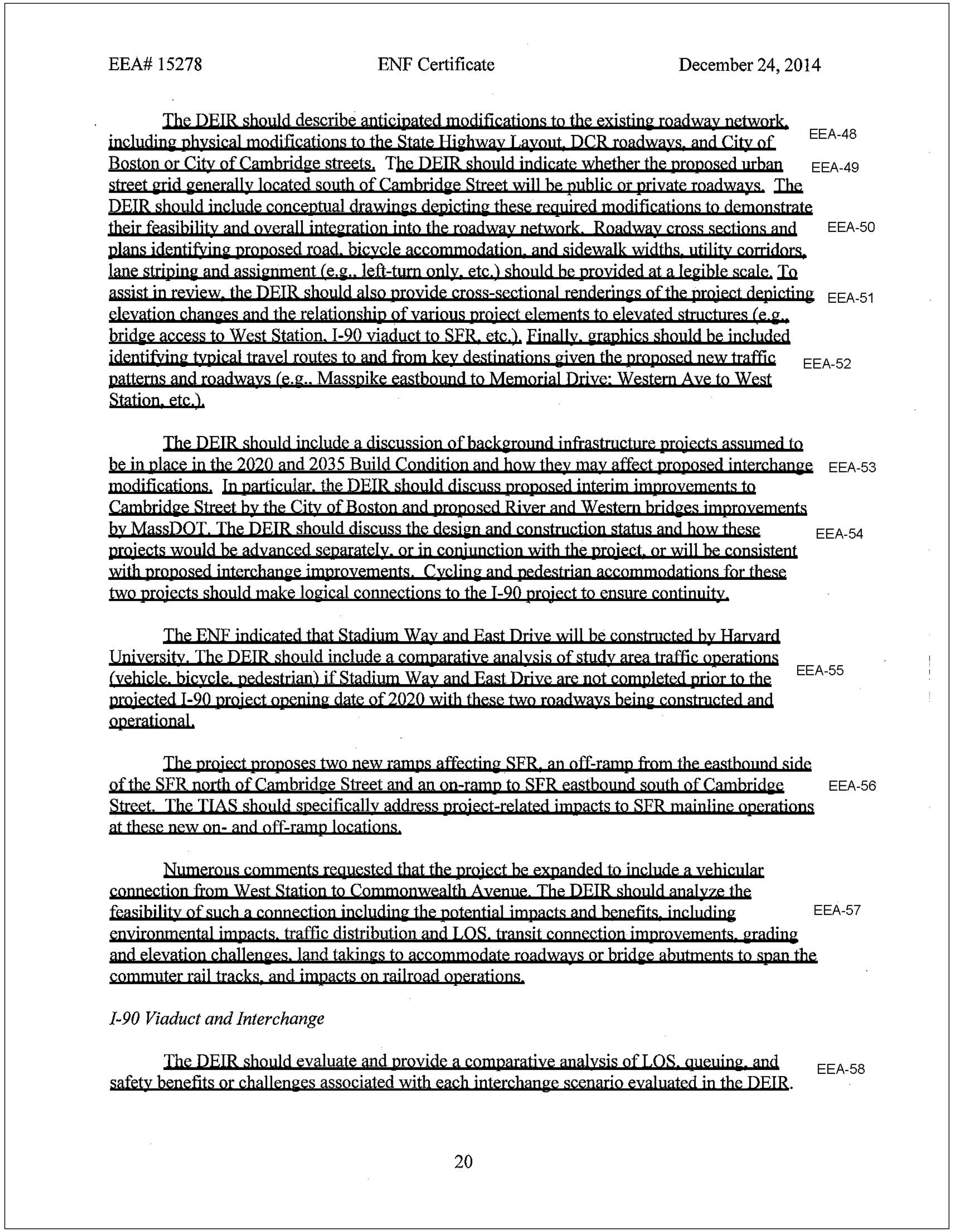

EEA# 15278 ENF Certificate December 24, 2014

The DEIR should describe anticipated modifications to the existing roadway network, EEA-48 including physical modifications to the State Highway Layout, DCR roadways, and City of Boston or City of Cambridge streets. EEA-49 The DEIR should indicate whether the proposed urban street grid generally located south of Cambridge Street will be public or private roadways. EEA-50 The DEIR should include conceptual drawings depicting these required modifications to demonstrate their feasibility and overall integration into the roadway network. Roadway cross sections and plans identifying proposed road, bicycle accommodation, and sidewalk widths, utility corridors, lane striping and assignment (e.g., left-turn only, etc.) should be provided at a legible scale. EEA-51 To assist in review, the DEIR should also provide cross-sectional renderings of the project depicting elevation changes and the relationship of various project elements to elevated structures (e.g., bridge access to West Station, I-90 viaduct to SFR, etc.). EEA-52 Finally, graphics should be included identifying typical travel routes to and from key destinations given the proposed new traffic patterns and roadways (e.g., Masspike eastbound to Memorial Drive; Western Ave to West Station, etc.).

The DEIR should include a discussion of background infrastructure projects assumed to be in place in the 2020 and 2035 Build Condition and how they may affect proposed interchange modifications. EEA-53 In particular, the DEIR should discuss proposed interim improvements to Cambridge Street by the City of Boston and proposed River and Western bridges improvements by MassDOT. EEA-54 The DEIR should discuss the design and construction status and how these projects would be advanced separately, or in conjunction with the project, or will be consistent with proposed interchange improvements. Cycling and pedestrian accommodations for these two projects should make logical connections to the I-90 project to ensure continuity.

The ENF indicated that Stadium Way and East Drive will be constructed by Harvard University. EEA-55 The DEIR should include a comparative analysis of study area traffic operations (vehicle, bicycle, pedestrian) if Stadium Way and East Drive are not completed prior to the projected I-90 project opening date of 2020 with these two roadways being constructed and operational.

The project proposes two new ramps affecting SFR, an off-ramp from the eastbound side of the SFR north of Cambridge Street and an on-ramp to SFR eastbound south of Cambridge Street. EEA-56 The TIAS should specifically address project-related impacts to SFR mainline operations at these new on- and off-ramp locations.

Numerous comments requested that the project be expanded to include a vehicular connection from West Station to Commonwealth Avenue. EEA-57 The DEIR should analyze the feasibility of such a connection including the potential impacts and benefits, including environmental impacts, traffic distribution and LOS, transit connection improvements, grading and elevation challenges, land takings to accommodate roadways or bridge abutments to span the commuter rail tracks, and impacts on railroad operations.

I-90 Viaduct and Interchange

EEA-58 The DEIR should evaluate and provide a comparative analysis of LOS, queuing, and safety benefits or challenges associated with each interchange scenario evaluated in the DEIR.

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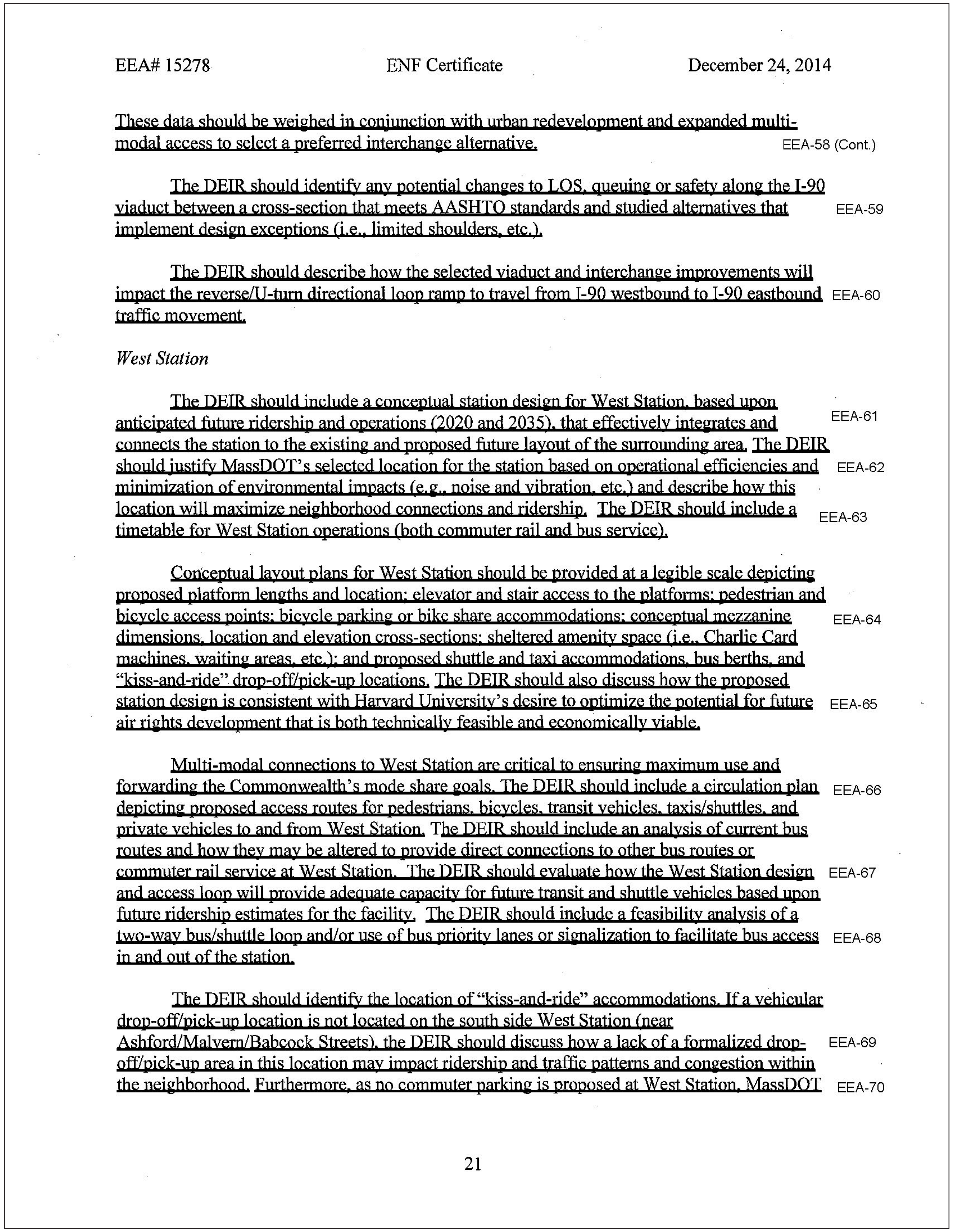

EEA# 15278 ENF Certificate December 24, 2014

These data should be weighed in conjunction with urban redevelopment and expanded multi-modal access to select a preferred interchange alternative. EEA-58 (Cont.)

The DEIR should identify any potential changes to LOS, queuing or safety along the I-90 viaduct between a cross-section that meets AASHTO standards and studied alternatives that implement design exceptions (i.e., limited shoulders, etc.). EEA-59

The DEIR should describe how the selected viaduct and interchange improvements will impact the reverse/U-turn directional loop ramp to travel from I-90 westbound to I-90 eastbound traffic movement. EEA-60

West Station

The DEIR should include a conceptual station design for West Station, based upon anticipated future ridership and operations (2020 and 2035), that effectively integrates and connects the station to the existing and proposed future layout of the surrounding area. EEA-61 The DEIR should justify MassDOT's selected location for the station based on operational efficiencies and minimization of environmental impacts (e.g., noise and vibration, etc.) and describe how this location will maximize neighborhood connections and ridership. EEA-62 The DEIR should include a timetable for West Station operations (both commuter rail and bus service). EEA-63

Conceptual layout plans for West Station should be provided at a legible scale depicting proposed platform lengths and location; elevator and stair access to the platforms; pedestrian and bicycle access points; bicycle parking or bike share accommodations; conceptual mezzanine dimensions, location and elevation cross-sections; sheltered amenity space (i.e., Charlie Card machines, waiting areas, etc.); and proposed shuttle and taxi accommodations, bus berths, and "kiss-and-ride" drop-off/pick-up locations. EEA-64 The DEIR should also discuss how the proposed station design is consistent with Harvard University's desire to optimize the potential for future air rights development that is both technically feasible and economically viable. EEA-65

Multi-modal connections to West Station are critical to ensuring maximum use and forwarding the Commonwealth's mode share goals. The DEIR should include a circulation plan depicting proposed access routes for pedestrians, bicycles, transit vehicles, taxis/shuttles, and private vehicles to and from West Station. EEA-66 The DEIR should include an analysis of current bus routes and how they may be altered to provide direct connections to other bus routes or commuter rail service at West Station. The DEIR should evaluate how the West Station design and access loop will provide adequate capacity for future transit and shuttle vehicles based upon future ridership estimates for the facility. EEA-67 The DEIR should include a feasibility analysis of a two-way bus/shuttle loop and/or use of bus priority lanes or signalization to facilitate bus access in and out of the station. EEA-68

The DEIR should identify the location of "kiss-and-ride" accommodations. If a vehicular drop-off/pick-up location is not located on the south side West Station (near Ashford/Malvern/Babcock Streets), the DEIR should discuss how a lack of a formalized drop-off/pick-up area in this location may impact ridership and traffic patterns and congestion within the neighborhood. EEA-69 Furthermore, as no commuter parking is proposed at West Station, MassDOT EEA-70

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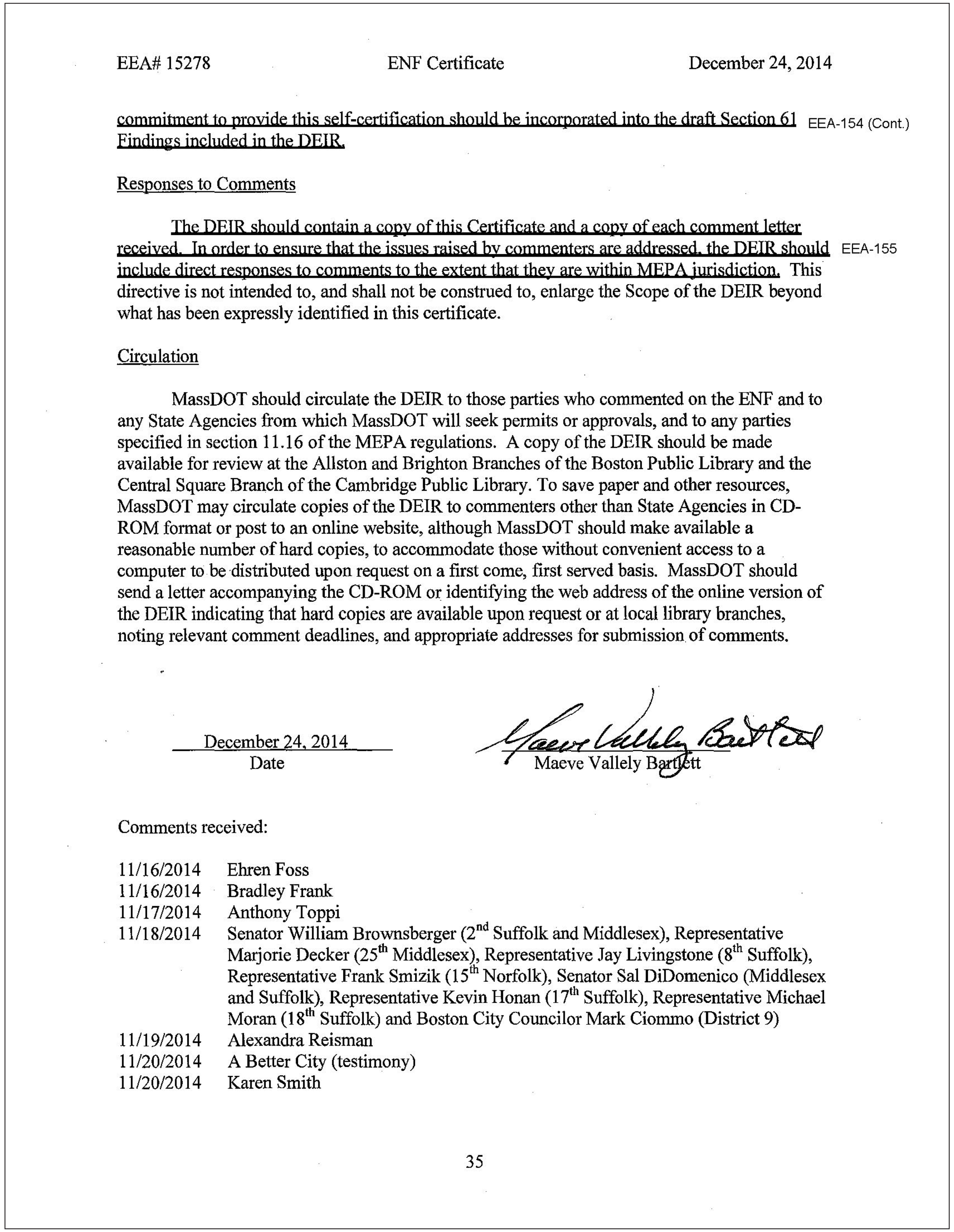


commitment to provide this self-certification should be incorporated into the draft Section 61 Findings included in the DEIR. EEA-154 (Cont.)

Responses to Comments

The DEIR should contain a copy of this Certificate and a copy of each comment letter received. In order to ensure that the issues raised by commenters are addressed, the DEIR should include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the Scope of the DEIR beyond what has been expressly identified in this certificate. EEA-155

Circulation

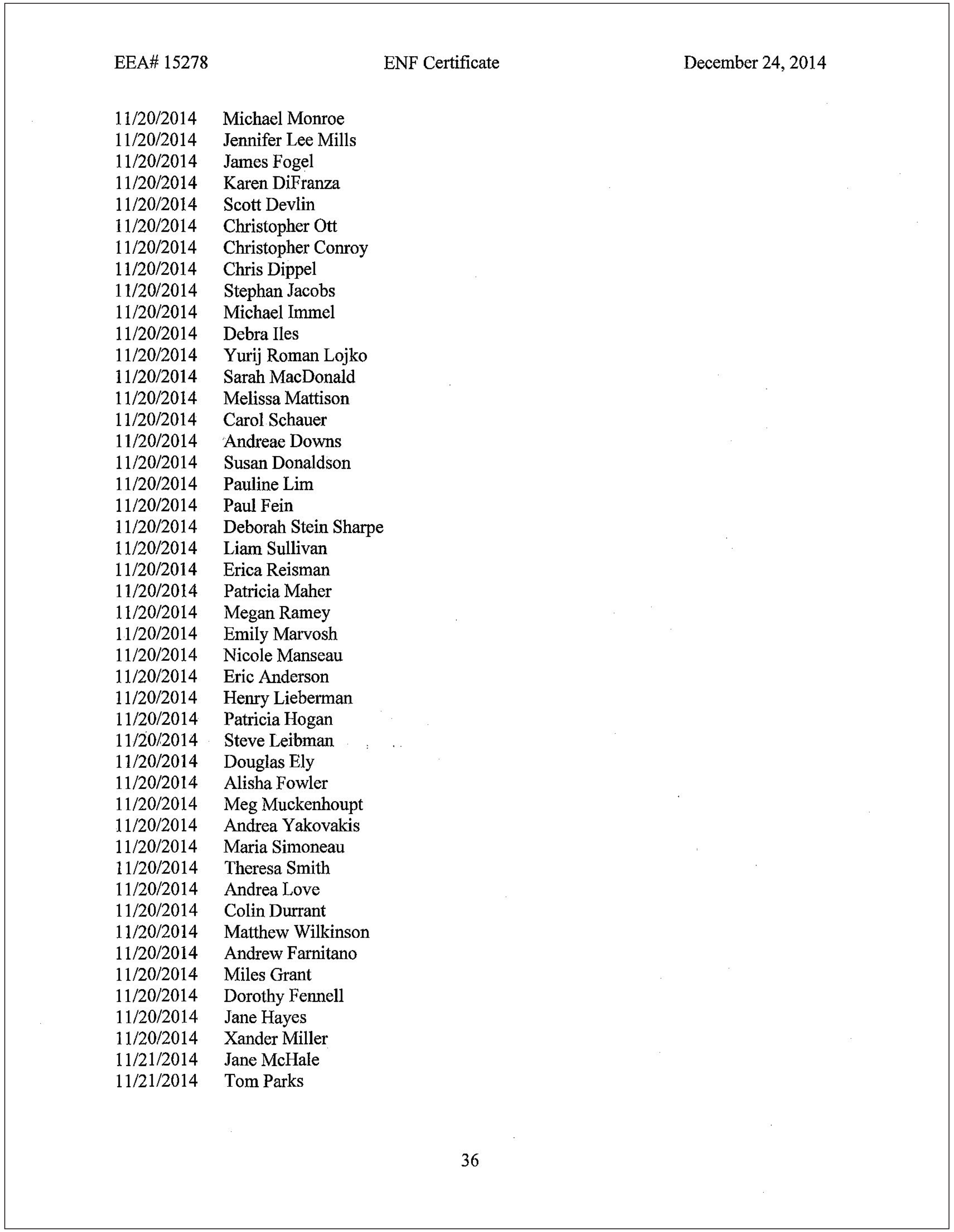
MassDOT should circulate the DEIR to those parties who commented on the ENF and to any State Agencies from which MassDOT will seek permits or approvals, and to any parties specified in section 11.16 of the MEPA regulations. A copy of the DEIR should be made available for review at the Allston and Brighton Branches of the Boston Public Library and the Central Square Branch of the Cambridge Public Library. To save paper and other resources, MassDOT may circulate copies of the DEIR to commenters other than State Agencies in CD-ROM format or post to an online website, although MassDOT should make available a reasonable number of hard copies, to accommodate those without convenient access to a computer to be distributed upon request on a first come, first served basis. MassDOT should send a letter accompanying the CD-ROM or identifying the web address of the online version of the DEIR indicating that hard copies are available upon request or at local library branches, noting relevant comment deadlines, and appropriate addresses for submission of comments.

December 24, 2014
Date

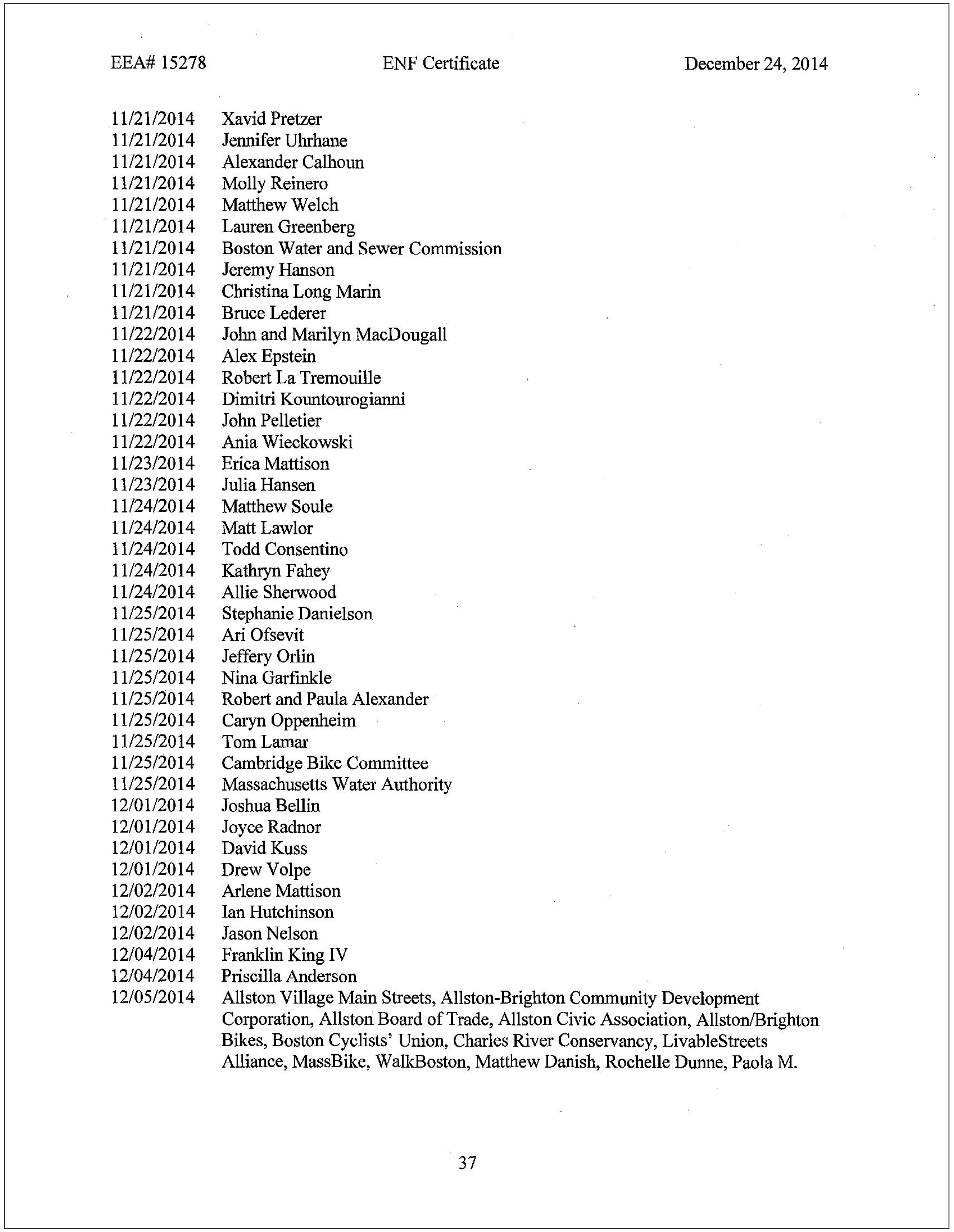
Maeve Vallely Bartlett
Maeve Vallely Bartlett

Comments received:

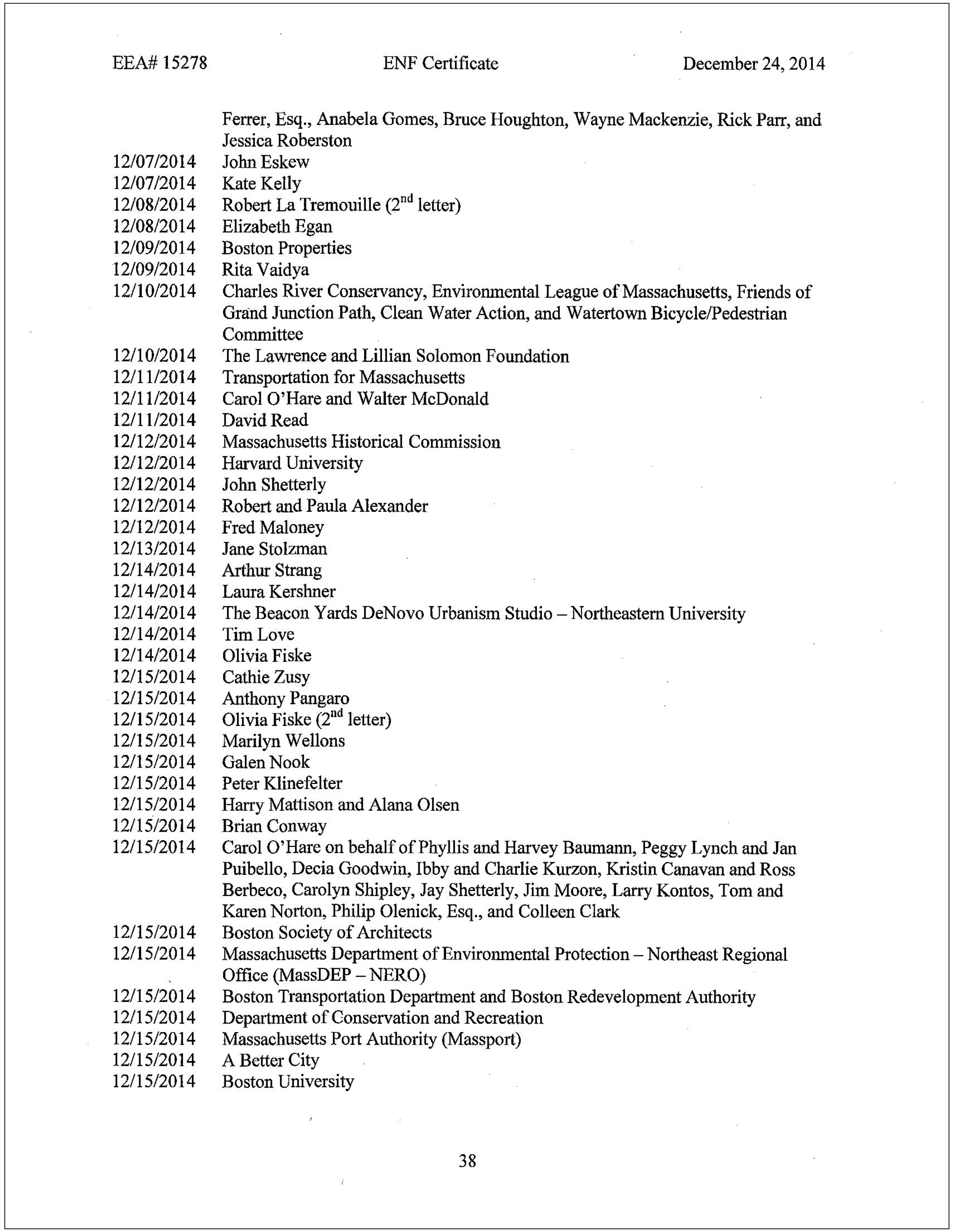
11/16/2014	Ehren Foss
11/16/2014	Bradley Frank
11/17/2014	Anthony Toppi
11/18/2014	Senator William Brownsberger (2nd Suffolk and Middlesex), Representative Marjorie Decker (25th Middlesex), Representative Jay Livingstone (8th Suffolk), Representative Frank Smizik (15th Norfolk), Senator Sal DiDomenico (Middlesex and Suffolk), Representative Kevin Honan (17th Suffolk), Representative Michael Moran (18th Suffolk) and Boston City Councilor Mark Ciommo (District 9)
11/19/2014	Alexandra Reisman
11/20/2014	A Better City (testimony)
11/20/2014	Karen Smith



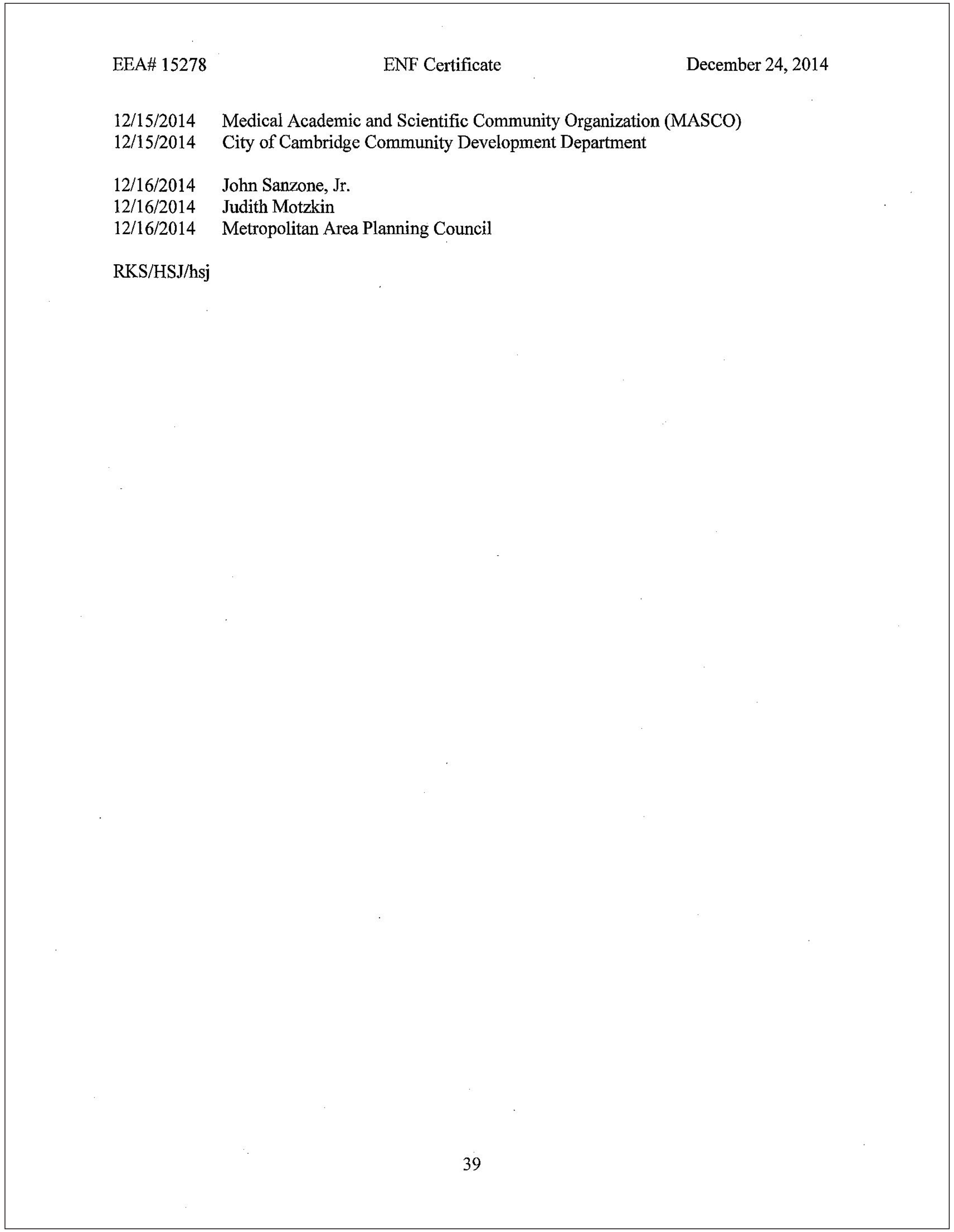
11/20/2014	Michael Monroe
11/20/2014	Jennifer Lee Mills
11/20/2014	James Fogel
11/20/2014	Karen DiFranza
11/20/2014	Scott Devlin
11/20/2014	Christopher Ott
11/20/2014	Christopher Conroy
11/20/2014	Chris Dippel
11/20/2014	Stephan Jacobs
11/20/2014	Michael Immel
11/20/2014	Debra Iles
11/20/2014	Yurij Roman Lojko
11/20/2014	Sarah MacDonald
11/20/2014	Melissa Mattison
11/20/2014	Carol Schauer
11/20/2014	Andreae Downs
11/20/2014	Susan Donaldson
11/20/2014	Pauline Lim
11/20/2014	Paul Fein
11/20/2014	Deborah Stein Sharpe
11/20/2014	Liam Sullivan
11/20/2014	Erica Reisman
11/20/2014	Patricia Maher
11/20/2014	Megan Ramey
11/20/2014	Emily Marvosh
11/20/2014	Nicole Manseau
11/20/2014	Eric Anderson
11/20/2014	Henry Lieberman
11/20/2014	Patricia Hogan
11/20/2014	Steve Leibman
11/20/2014	Douglas Ely
11/20/2014	Alisha Fowler
11/20/2014	Meg Muckenhoupt
11/20/2014	Andrea Yakovakis
11/20/2014	Maria Simoneau
11/20/2014	Theresa Smith
11/20/2014	Andrea Love
11/20/2014	Colin Durrant
11/20/2014	Matthew Wilkinson
11/20/2014	Andrew Farnitano
11/20/2014	Miles Grant
11/20/2014	Dorothy Fennell
11/20/2014	Jane Hayes
11/20/2014	Xander Miller
11/21/2014	Jane McHale
11/21/2014	Tom Parks



11/21/2014	Xavid Pretzer
11/21/2014	Jennifer Uhrhane
11/21/2014	Alexander Calhoun
11/21/2014	Molly Reinero
11/21/2014	Matthew Welch
11/21/2014	Lauren Greenberg
11/21/2014	Boston Water and Sewer Commission
11/21/2014	Jeremy Hanson
11/21/2014	Christina Long Marin
11/21/2014	Bruce Lederer
11/22/2014	John and Marilyn MacDougall
11/22/2014	Alex Epstein
11/22/2014	Robert La Tremouille
11/22/2014	Dimitri Kountourogianni
11/22/2014	John Pelletier
11/22/2014	Ania Wieckowski
11/23/2014	Erica Mattison
11/23/2014	Julia Hansen
11/24/2014	Matthew Soule
11/24/2014	Matt Lawlor
11/24/2014	Todd Consentino
11/24/2014	Kathryn Fahey
11/24/2014	Allie Sherwood
11/25/2014	Stephanie Danielson
11/25/2014	Ari Ofsevit
11/25/2014	Jeffery Orlin
11/25/2014	Nina Garfinkle
11/25/2014	Robert and Paula Alexander
11/25/2014	Caryn Oppenheim
11/25/2014	Tom Lamar
11/25/2014	Cambridge Bike Committee
11/25/2014	Massachusetts Water Authority
12/01/2014	Joshua Bellin
12/01/2014	Joyce Radnor
12/01/2014	David Kuss
12/01/2014	Drew Volpe
12/02/2014	Arlene Mattison
12/02/2014	Ian Hutchinson
12/02/2014	Jason Nelson
12/04/2014	Franklin King IV
12/04/2014	Priscilla Anderson
12/05/2014	Allston Village Main Streets, Allston-Brighton Community Development Corporation, Allston Board of Trade, Allston Civic Association, Allston/Brighton Bikes, Boston Cyclists' Union, Charles River Conservancy, LivableStreets Alliance, MassBike, WalkBoston, Matthew Danish, Rochelle Dunne, Paola M.



	Ferrer, Esq., Anabela Gomes, Bruce Houghton, Wayne Mackenzie, Rick Parr, and Jessica Roberston
12/07/2014	John Eskew
12/07/2014	Kate Kelly
12/08/2014	Robert La Tremouille (2nd letter)
12/08/2014	Elizabeth Egan
12/09/2014	Boston Properties
12/09/2014	Rita Vaidya
12/10/2014	Charles River Conservancy, Environmental League of Massachusetts, Friends of Grand Junction Path, Clean Water Action, and Watertown Bicycle/Pedestrian Committee
12/10/2014	The Lawrence and Lillian Solomon Foundation
12/11/2014	Transportation for Massachusetts
12/11/2014	Carol O'Hare and Walter McDonald
12/11/2014	David Read
12/12/2014	Massachusetts Historical Commission
12/12/2014	Harvard University
12/12/2014	John Shetterly
12/12/2014	Robert and Paula Alexander
12/12/2014	Fred Maloney
12/13/2014	Jane Stolzman
12/14/2014	Arthur Strang
12/14/2014	Laura Kershner
12/14/2014	The Beacon Yards DeNovo Urbanism Studio – Northeastern University
12/14/2014	Tim Love
12/14/2014	Olivia Fiske
12/15/2014	Cathie Zusy
12/15/2014	Anthony Pangaro
12/15/2014	Olivia Fiske (2nd letter)
12/15/2014	Marilyn Wellons
12/15/2014	Galen Nook
12/15/2014	Peter Klinefelter
12/15/2014	Harry Mattison and Alana Olsen
12/15/2014	Brian Conway
12/15/2014	Carol O'Hare on behalf of Phyllis and Harvey Baumann, Peggy Lynch and Jan Puibello, Decia Goodwin, Ibby and Charlie Kurzon, Kristin Canavan and Ross Berbeco, Carolyn Shipley, Jay Shetterly, Jim Moore, Larry Kontos, Tom and Karen Norton, Philip Olenick, Esq., and Colleen Clark
12/15/2014	Boston Society of Architects
12/15/2014	Massachusetts Department of Environmental Protection – Northeast Regional Office (MassDEP – NERO)
12/15/2014	Boston Transportation Department and Boston Redevelopment Authority
12/15/2014	Department of Conservation and Recreation
12/15/2014	Massachusetts Port Authority (Massport)
12/15/2014	A Better City
12/15/2014	Boston University



EEA# 15278 ENF Certificate December 24, 2014

12/15/2014 Medical Academic and Scientific Community Organization (MASCO)
12/15/2014 City of Cambridge Community Development Department

12/16/2014 John Sanzone, Jr.
12/16/2014 Judith Motzkin
12/16/2014 Metropolitan Area Planning Council

RKS/HSJ/hsj

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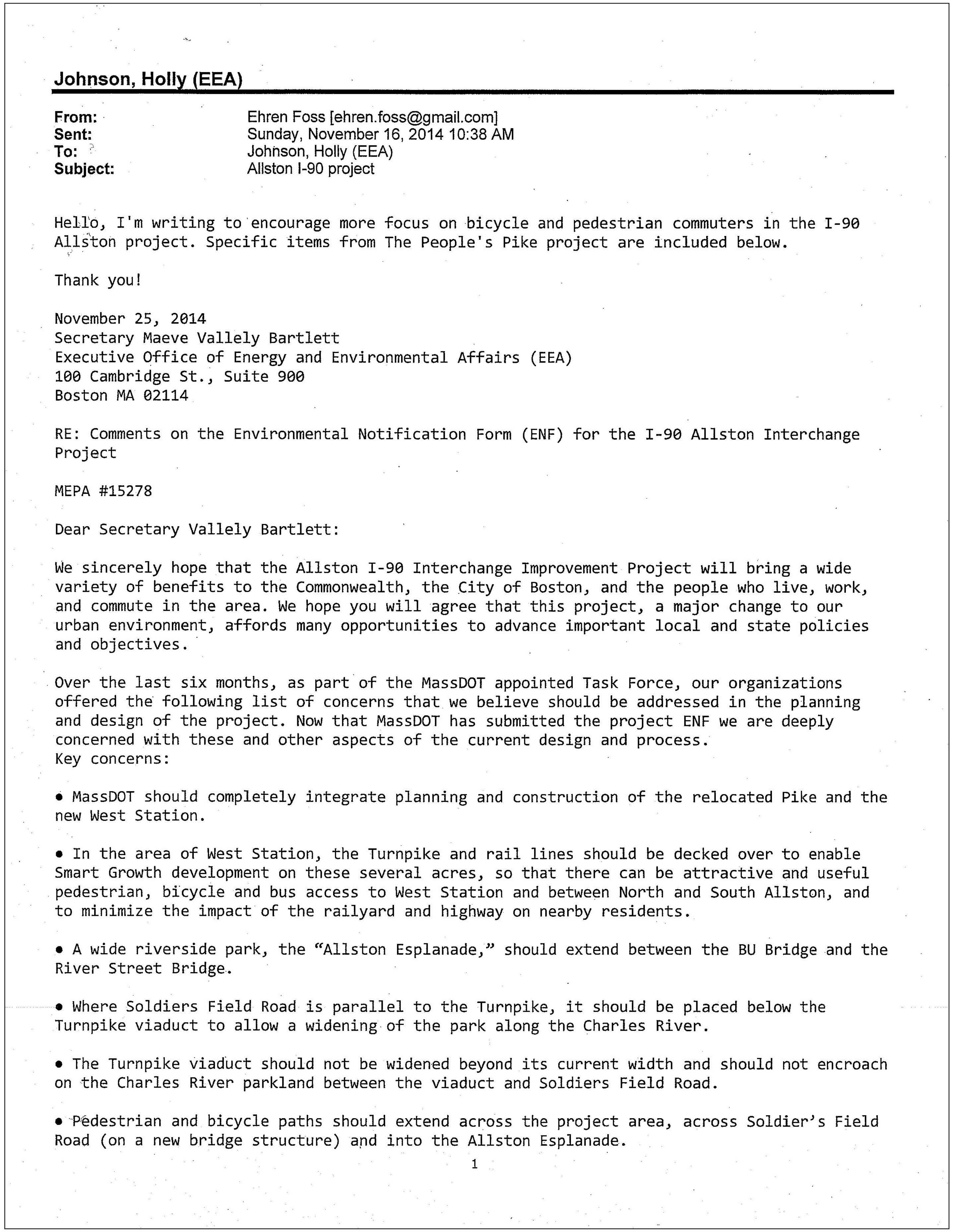

Johnson, Holly (EEA)

From: Ehren Foss [ehren.foss@gmail.com]
Sent: Sunday, November 16, 2014 10:38 AM
To: Johnson, Holly (EEA)
Subject: Allston I-90 project

Hello, I'm writing to encourage more focus on bicycle and pedestrian commuters in the I-90 Allston project. Specific items from The People's Pike project are included below.

Thank you!

November 25, 2014
Secretary Maeve Vallely Bartlett
Executive Office of Energy and Environmental Affairs (EEA)
100 Cambridge St., Suite 900
Boston MA 02114

RE: Comments on the Environmental Notification Form (ENF) for the I-90 Allston Interchange Project

MEPA #15278

Dear Secretary Vallely Bartlett:

We sincerely hope that the Allston I-90 Interchange Improvement Project will bring a wide variety of benefits to the Commonwealth, the City of Boston, and the people who live, work, and commute in the area. We hope you will agree that this project, a major change to our urban environment, affords many opportunities to advance important local and state policies and objectives.

Over the last six months, as part of the MassDOT appointed Task Force, our organizations offered the following list of concerns that we believe should be addressed in the planning and design of the project. Now that MassDOT has submitted the project ENF we are deeply concerned with these and other aspects of the current design and process.
Key concerns:

- MassDOT should completely integrate planning and construction of the relocated Pike and the new West Station.

- In the area of West Station, the Turnpike and rail lines should be decked over to enable Smart Growth development on these several acres, so that there can be attractive and useful pedestrian, bicycle and bus access to West Station and between North and South Allston, and to minimize the impact of the railyard and highway on nearby residents.

- A wide riverside park, the “Allston Esplanade,” should extend between the BU Bridge and the River Street Bridge.

- Where Soldiers Field Road is parallel to the Turnpike, it should be placed below the Turnpike viaduct to allow a widening of the park along the Charles River.

- The Turnpike viaduct should not be widened beyond its current width and should not encroach on the Charles River parkland between the viaduct and Soldiers Field Road.

- Pedestrian and bicycle paths should extend across the project area, across Soldier’s Field Road (on a new bridge structure) and into the Allston Esplanade.

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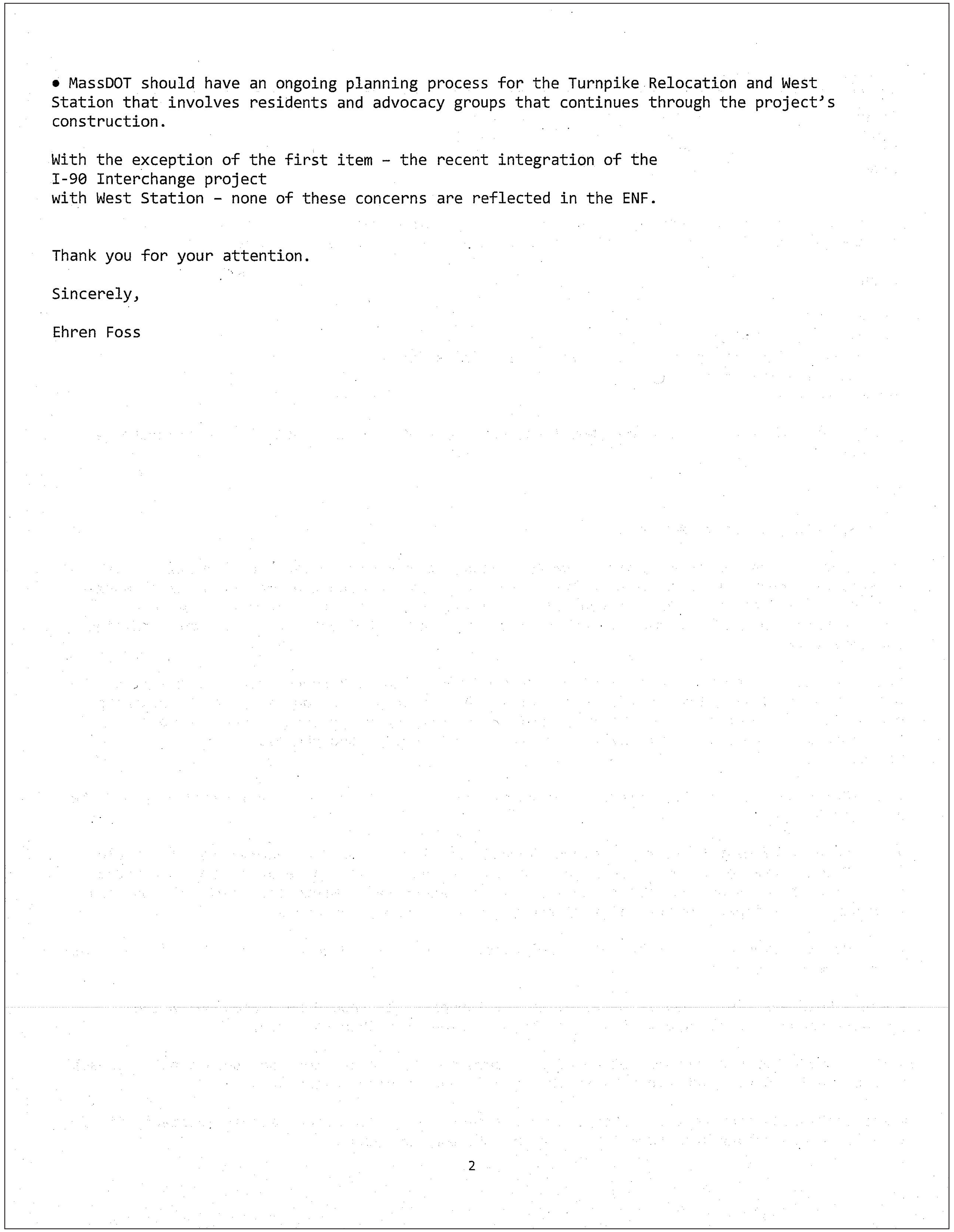


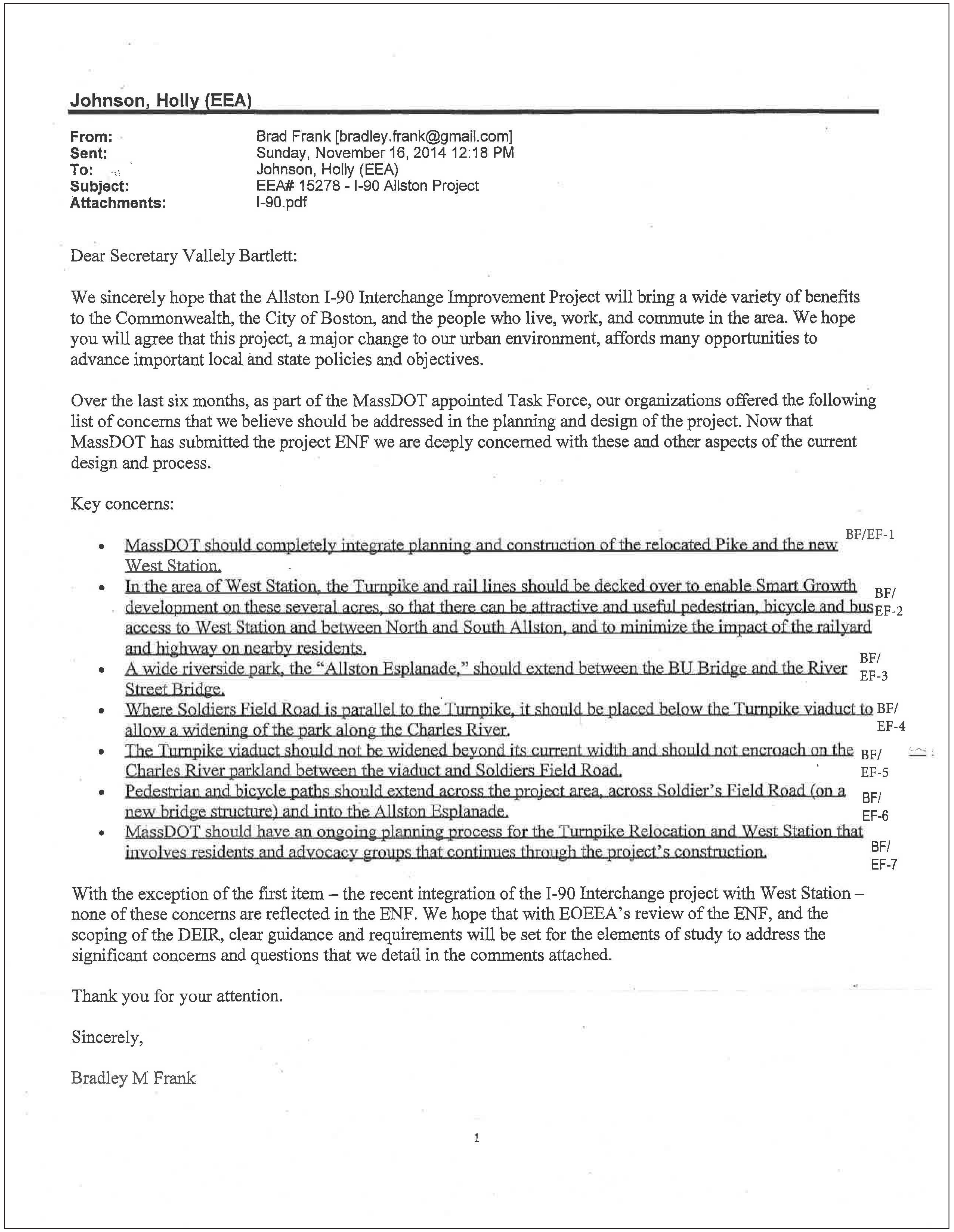
- MassDOT should have an ongoing planning process for the Turnpike Relocation and West Station that involves residents and advocacy groups that continues through the project's construction.

With the exception of the first item – the recent integration of the I-90 Interchange project with West Station – none of these concerns are reflected in the ENF.

Thank you for your attention.

Sincerely,

Ehren Foss



Johnson, Holly (EEA)

From: Brad Frank [bradley.frank@gmail.com]
Sent: Sunday, November 16, 2014 12:18 PM
To: Johnson, Holly (EEA)
Subject: EEA# 15278 - I-90 Allston Project
Attachments: I-90.pdf

Dear Secretary Vallely Bartlett:

We sincerely hope that the Allston I-90 Interchange Improvement Project will bring a wide variety of benefits to the Commonwealth, the City of Boston, and the people who live, work, and commute in the area. We hope you will agree that this project, a major change to our urban environment, affords many opportunities to advance important local and state policies and objectives.

Over the last six months, as part of the MassDOT appointed Task Force, our organizations offered the following list of concerns that we believe should be addressed in the planning and design of the project. Now that MassDOT has submitted the project ENF we are deeply concerned with these and other aspects of the current design and process.

Key concerns:

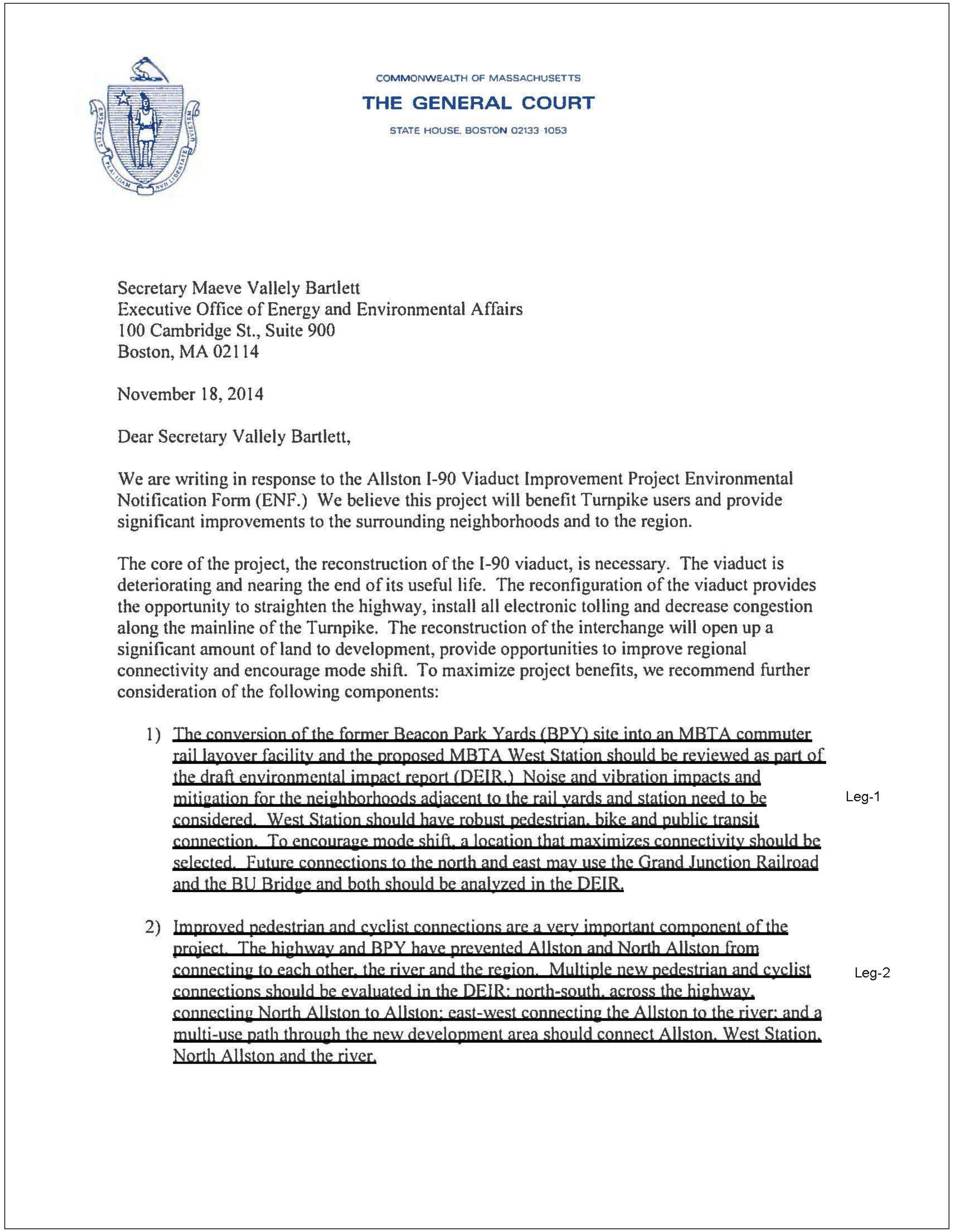
- MassDOT should completely integrate planning and construction of the relocated Pike and the new West Station. BF/EF-1
- In the area of West Station, the Turnpike and rail lines should be decked over to enable Smart Growth development on these several acres, so that there can be attractive and useful pedestrian, bicycle and bus access to West Station and between North and South Allston, and to minimize the impact of the railyard and highway on nearby residents. BF/EF-2
- A wide riverside park, the "Allston Esplanade," should extend between the BU Bridge and the River Street Bridge. BF/EF-3
- Where Soldiers Field Road is parallel to the Turnpike, it should be placed below the Turnpike viaduct to allow a widening of the park along the Charles River. BF/EF-4
- The Turnpike viaduct should not be widened beyond its current width and should not encroach on the Charles River parkland between the viaduct and Soldiers Field Road. BF/EF-5
- Pedestrian and bicycle paths should extend across the project area, across Soldier's Field Road (on a new bridge structure) and into the Allston Esplanade. BF/EF-6
- MassDOT should have an ongoing planning process for the Turnpike Relocation and West Station that involves residents and advocacy groups that continues through the project's construction. BF/EF-7

With the exception of the first item – the recent integration of the I-90 Interchange project with West Station – none of these concerns are reflected in the ENF. We hope that with EOEEA's review of the ENF, and the scoping of the DEIR, clear guidance and requirements will be set for the elements of study to address the significant concerns and questions that we detail in the comments attached.

Thank you for your attention.

Sincerely,

Bradley M Frank



COMMONWEALTH OF MASSACHUSETTS
THE GENERAL COURT
STATE HOUSE, BOSTON 02133 1053

Secretary Maeve Vallely Bartlett
Executive Office of Energy and Environmental Affairs
100 Cambridge St., Suite 900
Boston, MA 02114

November 18, 2014

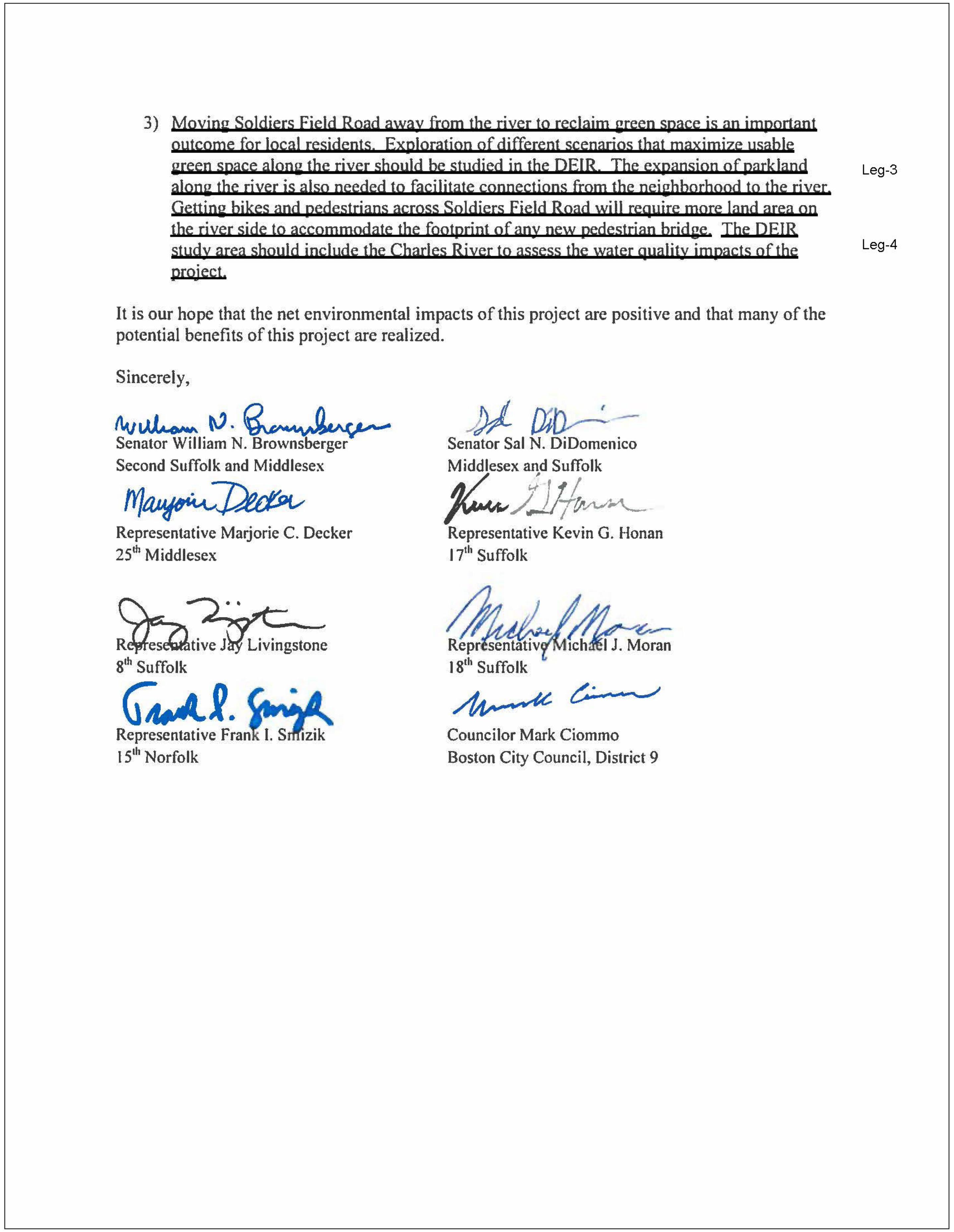
Dear Secretary Vallely Bartlett,

We are writing in response to the Allston I-90 Viaduct Improvement Project Environmental Notification Form (ENF.) We believe this project will benefit Turnpike users and provide significant improvements to the surrounding neighborhoods and to the region.

The core of the project, the reconstruction of the I-90 viaduct, is necessary. The viaduct is deteriorating and nearing the end of its useful life. The reconfiguration of the viaduct provides the opportunity to straighten the highway, install all electronic tolling and decrease congestion along the mainline of the Turnpike. The reconstruction of the interchange will open up a significant amount of land to development, provide opportunities to improve regional connectivity and encourage mode shift. To maximize project benefits, we recommend further consideration of the following components:

1) The conversion of the former Beacon Park Yards (BPY) site into an MBTA commuter rail layover facility and the proposed MBTA West Station should be reviewed as part of the draft environmental impact report (DEIR.) Noise and vibration impacts and mitigation for the neighborhoods adjacent to the rail yards and station need to be considered. West Station should have robust pedestrian, bike and public transit connection. To encourage mode shift, a location that maximizes connectivity should be selected. Future connections to the north and east may use the Grand Junction Railroad and the BU Bridge and both should be analyzed in the DEIR. Leg-1

2) Improved pedestrian and cyclist connections are a very important component of the project. The highway and BPY have prevented Allston and North Allston from connecting to each other, the river and the region. Multiple new pedestrian and cyclist connections should be evaluated in the DEIR: north-south, across the highway, connecting North Allston to Allston; east-west connecting the Allston to the river; and a multi-use path through the new development area should connect Allston, West Station, North Allston and the river. Leg-2



3) Moving Soldiers Field Road away from the river to reclaim green space is an important
outcome for local residents. Exploration of different scenarios that maximize usable
green space along the river should be studied in the DEIR. The expansion of parkland Leg-3
along the river is also needed to facilitate connections from the neighborhood to the river.
Getting bikes and pedestrians across Soldiers Field Road will require more land area on
the river side to accommodate the footprint of any new pedestrian bridge. The DEIR
study area should include the Charles River to assess the water quality impacts of the Leg-4
project.

It is our hope that the net environmental impacts of this project are positive and that many of the potential benefits of this project are realized.

Sincerely,

William N. Brownsberger
Senator William N. Brownsberger
Second Suffolk and Middlesex

Senator Sal N. DiDomenico
Middlesex and Suffolk

Marjorie Decker
Representative Marjorie C. Decker
25th Middlesex

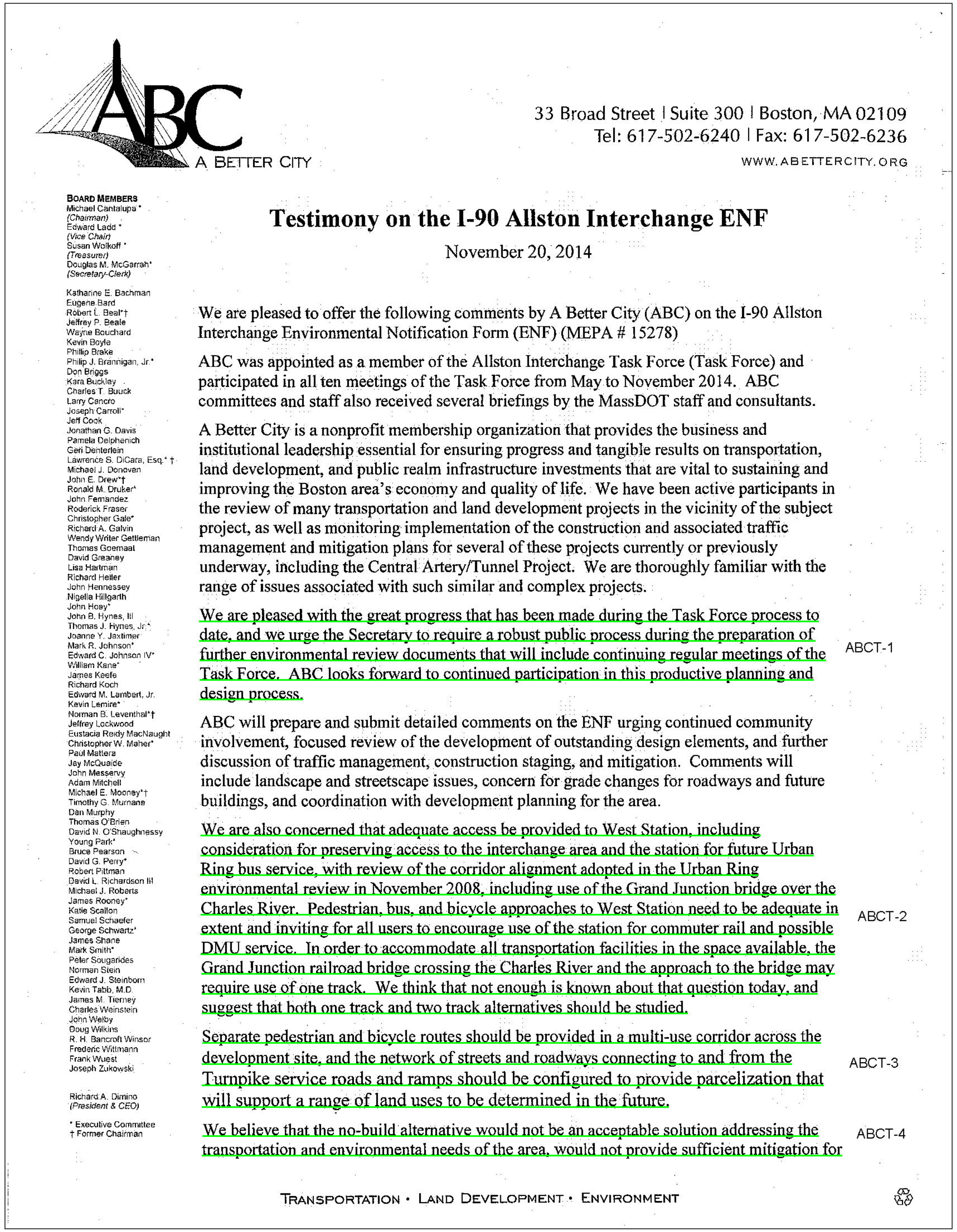
Representative Kevin G. Honan
17th Suffolk

Representative Jay Livingstone
8th Suffolk

Representative Michael J. Moran
18th Suffolk

Representative Frank I. Smizik
15th Norfolk

Councilor Mark Ciommo
Boston City Council, District 9



A BETTER CITY
33 Broad Street | Suite 300 | Boston, MA 02109
Tel: 617-502-6240 | Fax: 617-502-6236
WWW.ABETTERCITY.ORG

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R. H. Bancroft Winsor
Frederic Wittmann
Frank Wuest
Joseph Zukowski

Richard A. Dimino
(President & CEO)

* Executive Committee
† Former Chairman

Testimony on the I-90 Allston Interchange ENF

November 20, 2014

We are pleased to offer the following comments by A Better City (ABC) on the I-90 Allston Interchange Environmental Notification Form (ENF) (MEPA # 15278)

ABC was appointed as a member of the Allston Interchange Task Force (Task Force) and participated in all ten meetings of the Task Force from May to November 2014. ABC committees and staff also received several briefings by the MassDOT staff and consultants.

A Better City is a nonprofit membership organization that provides the business and institutional leadership essential for ensuring progress and tangible results on transportation, land development, and public realm infrastructure investments that are vital to sustaining and improving the Boston area's economy and quality of life. We have been active participants in the review of many transportation and land development projects in the vicinity of the subject project, as well as monitoring implementation of the construction and associated traffic management and mitigation plans for several of these projects currently or previously underway, including the Central Artery/Tunnel Project. We are thoroughly familiar with the range of issues associated with such similar and complex projects.

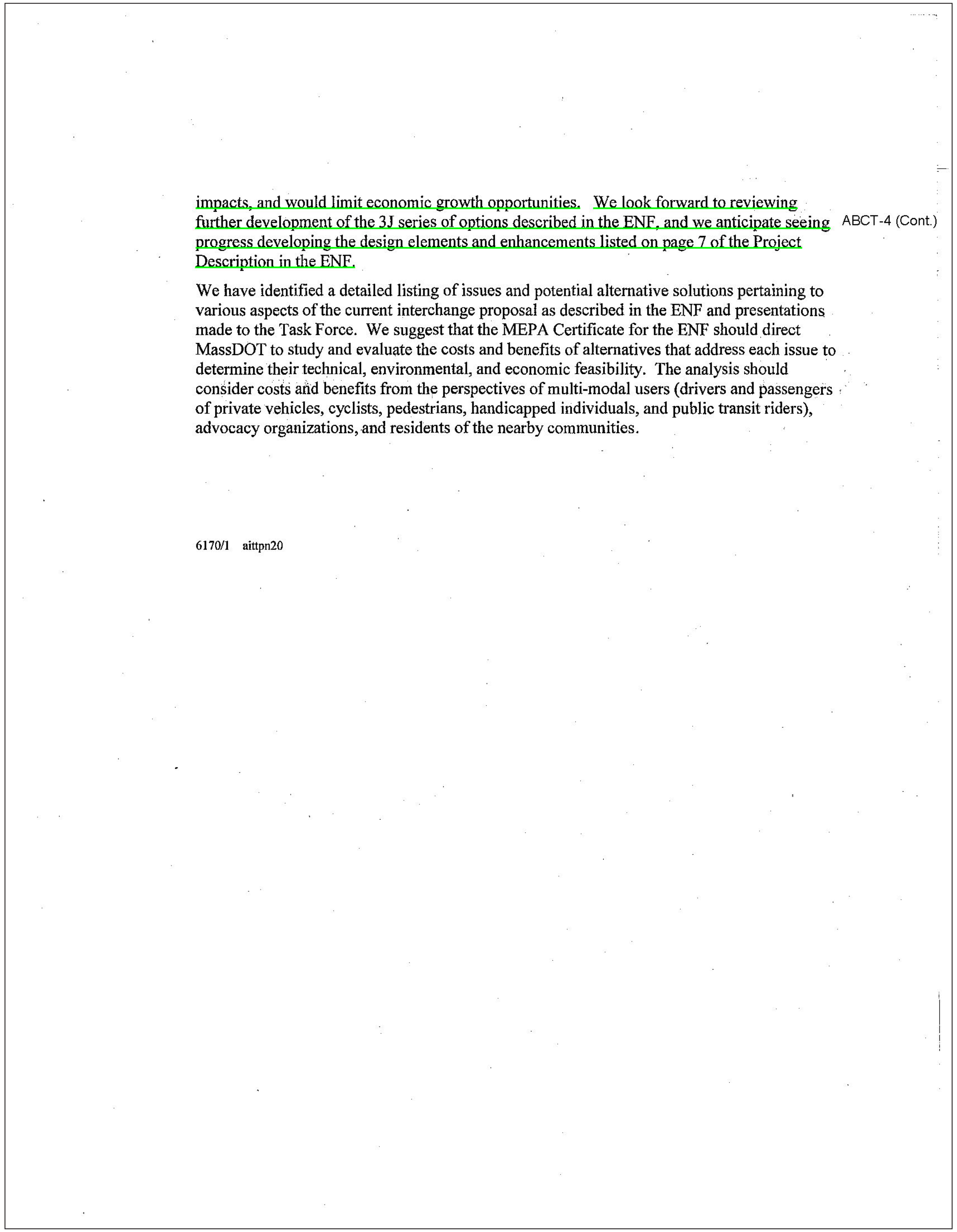
We are pleased with the great progress that has been made during the Task Force process to date, and we urge the Secretary to require a robust public process during the preparation of further environmental review documents that will include continuing regular meetings of the Task Force. ABC looks forward to continued participation in this productive planning and design process. ABCT-1

ABC will prepare and submit detailed comments on the ENF urging continued community involvement, focused review of the development of outstanding design elements, and further discussion of traffic management, construction staging, and mitigation. Comments will include landscape and streetscape issues, concern for grade changes for roadways and future buildings, and coordination with development planning for the area.

We are also concerned that adequate access be provided to West Station, including consideration for preserving access to the interchange area and the station for future Urban Ring bus service, with review of the corridor alignment adopted in the Urban Ring environmental review in November 2008, including use of the Grand Junction bridge over the Charles River. Pedestrian, bus, and bicycle approaches to West Station need to be adequate in extent and inviting for all users to encourage use of the station for commuter rail and possible DMU service. In order to accommodate all transportation facilities in the space available, the Grand Junction railroad bridge crossing the Charles River and the approach to the bridge may require use of one track. We think that not enough is known about that question today, and suggest that both one track and two track alternatives should be studied. ABCT-2

Separate pedestrian and bicycle routes should be provided in a multi-use corridor across the development site, and the network of streets and roadways connecting to and from the Turnpike service roads and ramps should be configured to provide parcelization that will support a range of land uses to be determined in the future. ABCT-3

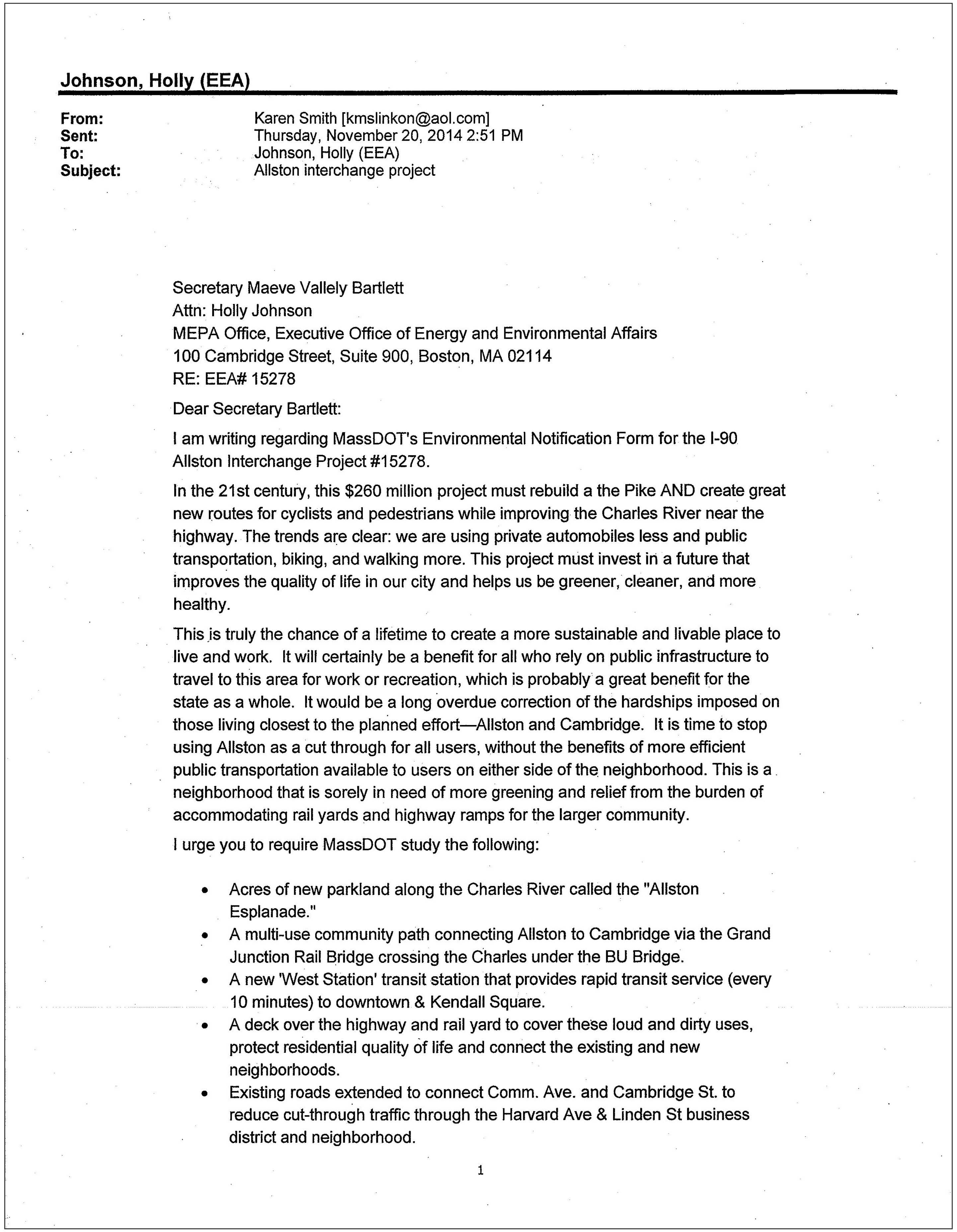
We believe that the no-build alternative would not be an acceptable solution addressing the transportation and environmental needs of the area, would not provide sufficient mitigation for ABCT-4



impacts, and would limit economic growth opportunities. We look forward to reviewing further development of the 3J series of options described in the ENF, and we anticipate seeing progress developing the design elements and enhancements listed on page 7 of the Project Description in the ENF. ABCT-4 (Cont.)

We have identified a detailed listing of issues and potential alternative solutions pertaining to various aspects of the current interchange proposal as described in the ENF and presentations made to the Task Force. We suggest that the MEPA Certificate for the ENF should direct MassDOT to study and evaluate the costs and benefits of alternatives that address each issue to determine their technical, environmental, and economic feasibility. The analysis should consider costs and benefits from the perspectives of multi-modal users (drivers and passengers of private vehicles, cyclists, pedestrians, handicapped individuals, and public transit riders), advocacy organizations, and residents of the nearby communities.

6170/1 aittpn20



Johnson, Holly (EEA)

From: Karen Smith [kmslinkon@aol.com]
Sent: Thursday, November 20, 2014 2:51 PM
To: Johnson, Holly (EEA)
Subject: Allston interchange project

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

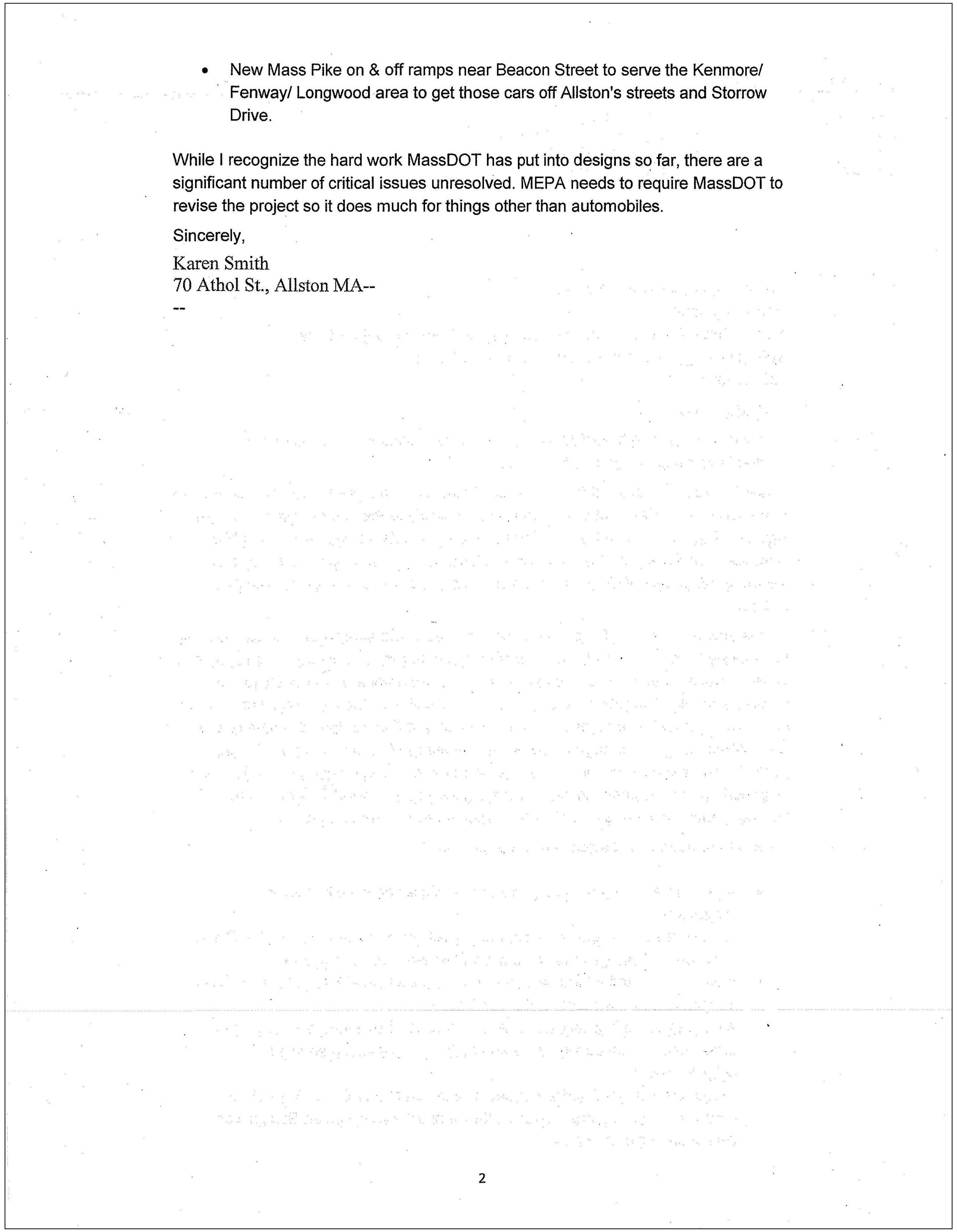
I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

This is truly the chance of a lifetime to create a more sustainable and livable place to live and work. It will certainly be a benefit for all who rely on public infrastructure to travel to this area for work or recreation, which is probably a great benefit for the state as a whole. It would be a long overdue correction of the hardships imposed on those living closest to the planned effort—Allston and Cambridge. It is time to stop using Allston as a cut through for all users, without the benefits of more efficient public transportation available to users on either side of the neighborhood. This is a neighborhood that is sorely in need of more greening and relief from the burden of accommodating rail yards and highway ramps for the larger community.

I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.

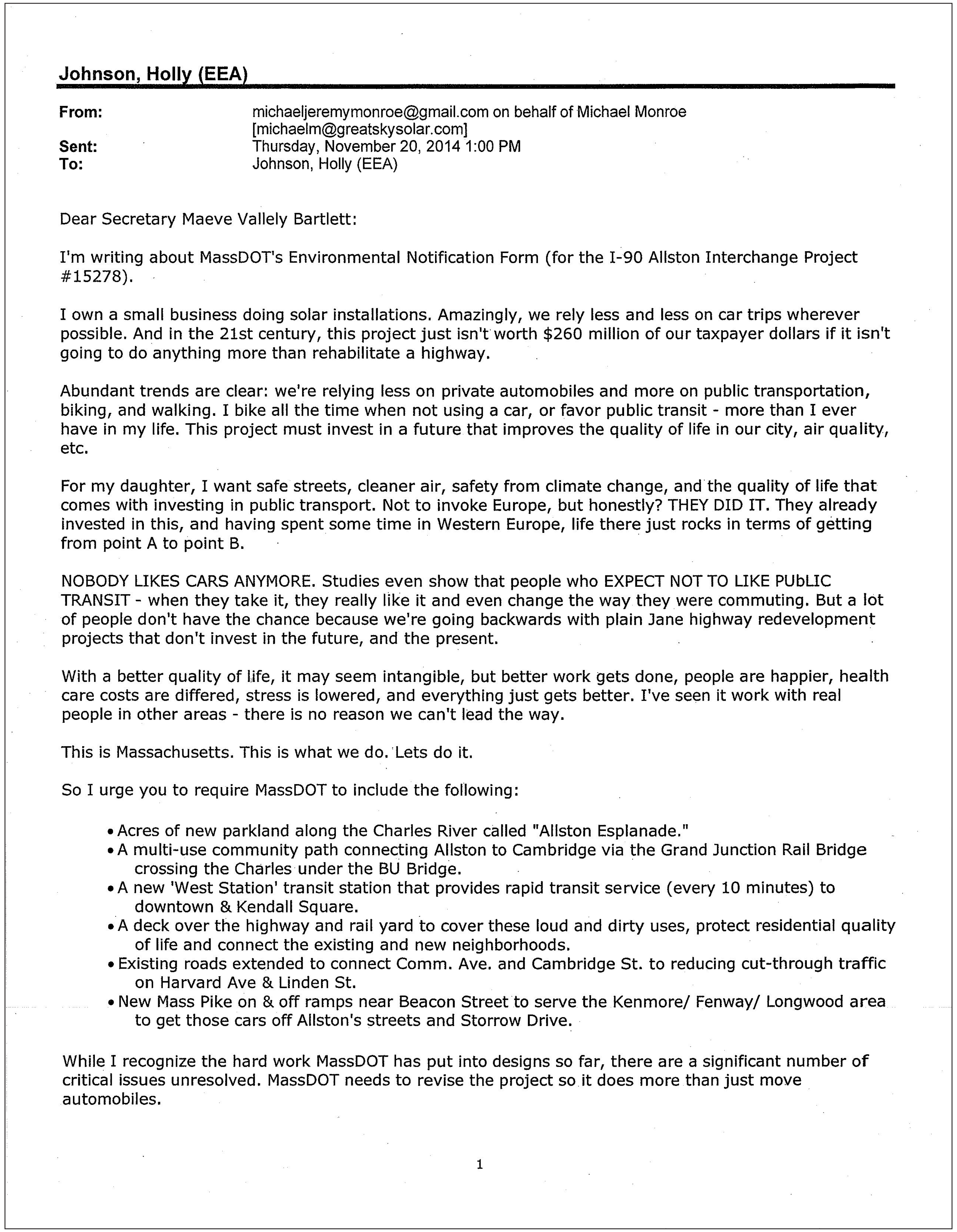


- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,

Karen Smith
70 Athol St., Allston MA--
--



Johnson, Holly (EEA)

From:	michaeljeremymonroe@gmail.com on behalf of Michael Monroe [michaelm@greatskysolar.com]
Sent:	Thursday, November 20, 2014 1:00 PM
To:	Johnson, Holly (EEA)

Dear Secretary Maeve Vallely Bartlett:

I'm writing about MassDOT's Environmental Notification Form (for the I-90 Allston Interchange Project #15278).

I own a small business doing solar installations. Amazingly, we rely less and less on car trips wherever possible. And in the 21st century, this project just isn't worth $260 million of our taxpayer dollars if it isn't going to do anything more than rehabilitate a highway.

Abundant trends are clear: we're relying less on private automobiles and more on public transportation, biking, and walking. I bike all the time when not using a car, or favor public transit - more than I ever have in my life. This project must invest in a future that improves the quality of life in our city, air quality, etc.

For my daughter, I want safe streets, cleaner air, safety from climate change, and the quality of life that comes with investing in public transport. Not to invoke Europe, but honestly? THEY DID IT. They already invested in this, and having spent some time in Western Europe, life there just rocks in terms of getting from point A to point B.

NOBODY LIKES CARS ANYMORE. Studies even show that people who EXPECT NOT TO LIKE PUbLIC TRANSIT - when they take it, they really like it and even change the way they were commuting. But a lot of people don't have the chance because we're going backwards with plain Jane highway redevelopment projects that don't invest in the future, and the present.

With a better quality of life, it may seem intangible, but better work gets done, people are happier, health care costs are differed, stress is lowered, and everything just gets better. I've seen it work with real people in other areas - there is no reason we can't lead the way.

This is Massachusetts. This is what we do. Lets do it.

So I urge you to require MassDOT to include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

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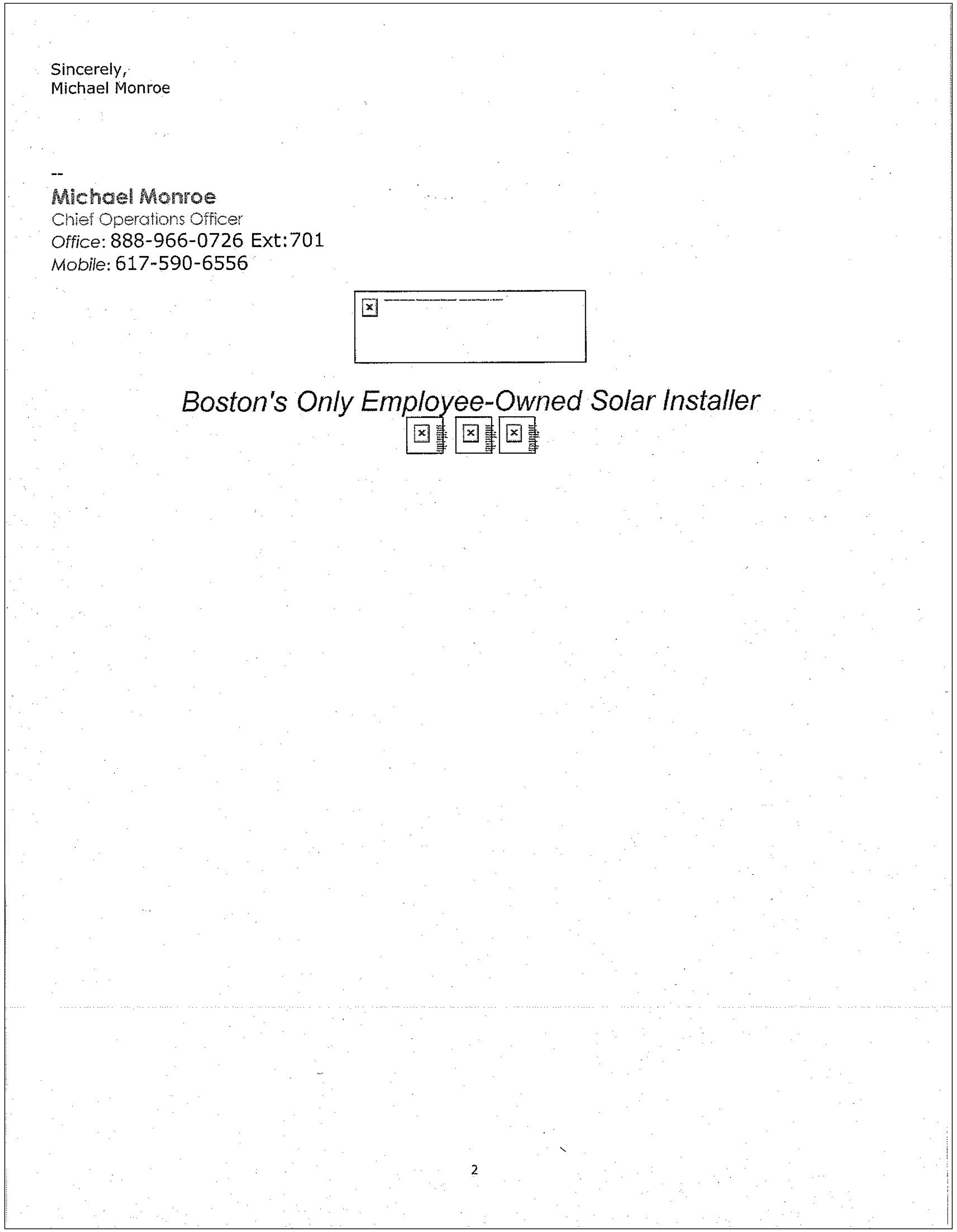
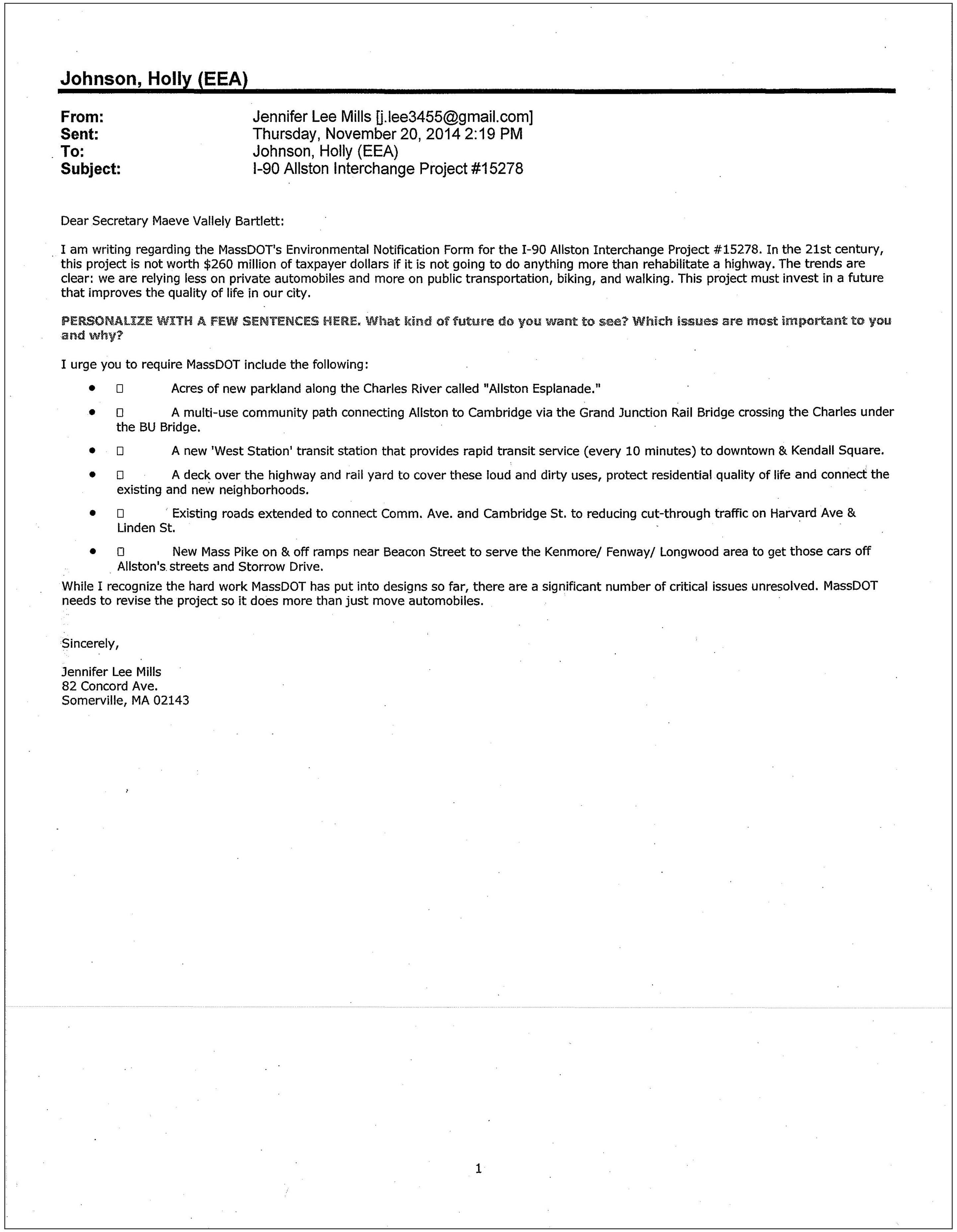


Sincerely,
Michael Monroe

--
Michael Monroe
Chief Operations Officer
Office: 888-966-0726 Ext:701
Mobile: 617-590-6556

Boston's Only Employee-Owned Solar Installer

2



Johnson, Holly (EEA)

From: Jennifer Lee Mills [j.lee3455@gmail.com]
Sent: Thursday, November 20, 2014 2:19 PM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

PERSONALIZE WITH A FEW SENTENCES HERE. What kind of future do you want to see? Which issues are most important to you and why?

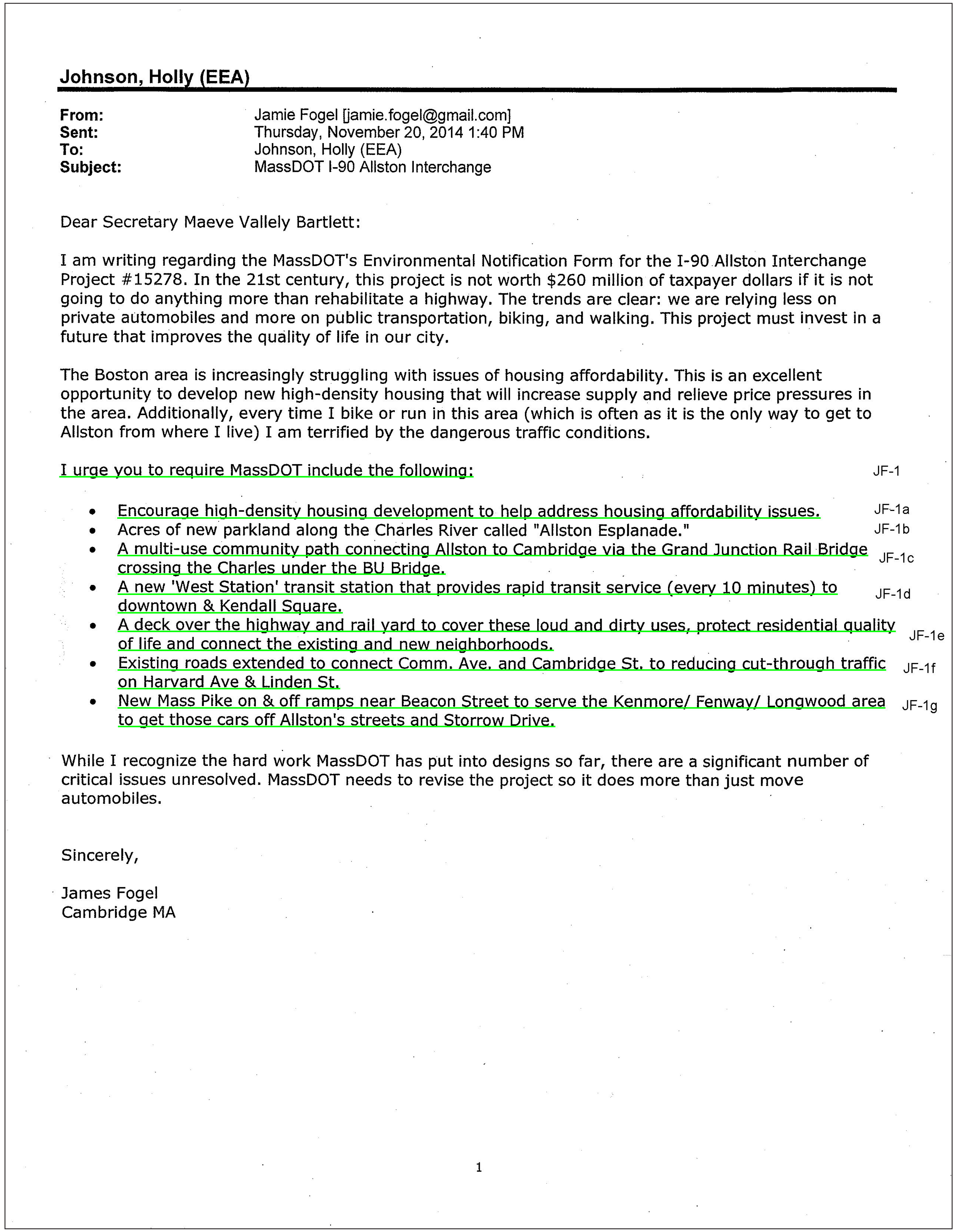
I urge you to require MassDOT include the following:

- ☐ Acres of new parkland along the Charles River called "Allston Esplanade."
- ☐ A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- ☐ A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- ☐ A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- ☐ Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- ☐ New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Jennifer Lee Mills
82 Concord Ave.
Somerville, MA 02143



Johnson, Holly (EEA)

From: Jamie Fogel [jamie.fogel@gmail.com]
Sent: Thursday, November 20, 2014 1:40 PM
To: Johnson, Holly (EEA)
Subject: MassDOT I-90 Allston Interchange

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

The Boston area is increasingly struggling with issues of housing affordability. This is an excellent opportunity to develop new high-density housing that will increase supply and relieve price pressures in the area. Additionally, every time I bike or run in this area (which is often as it is the only way to get to Allston from where I live) I am terrified by the dangerous traffic conditions.

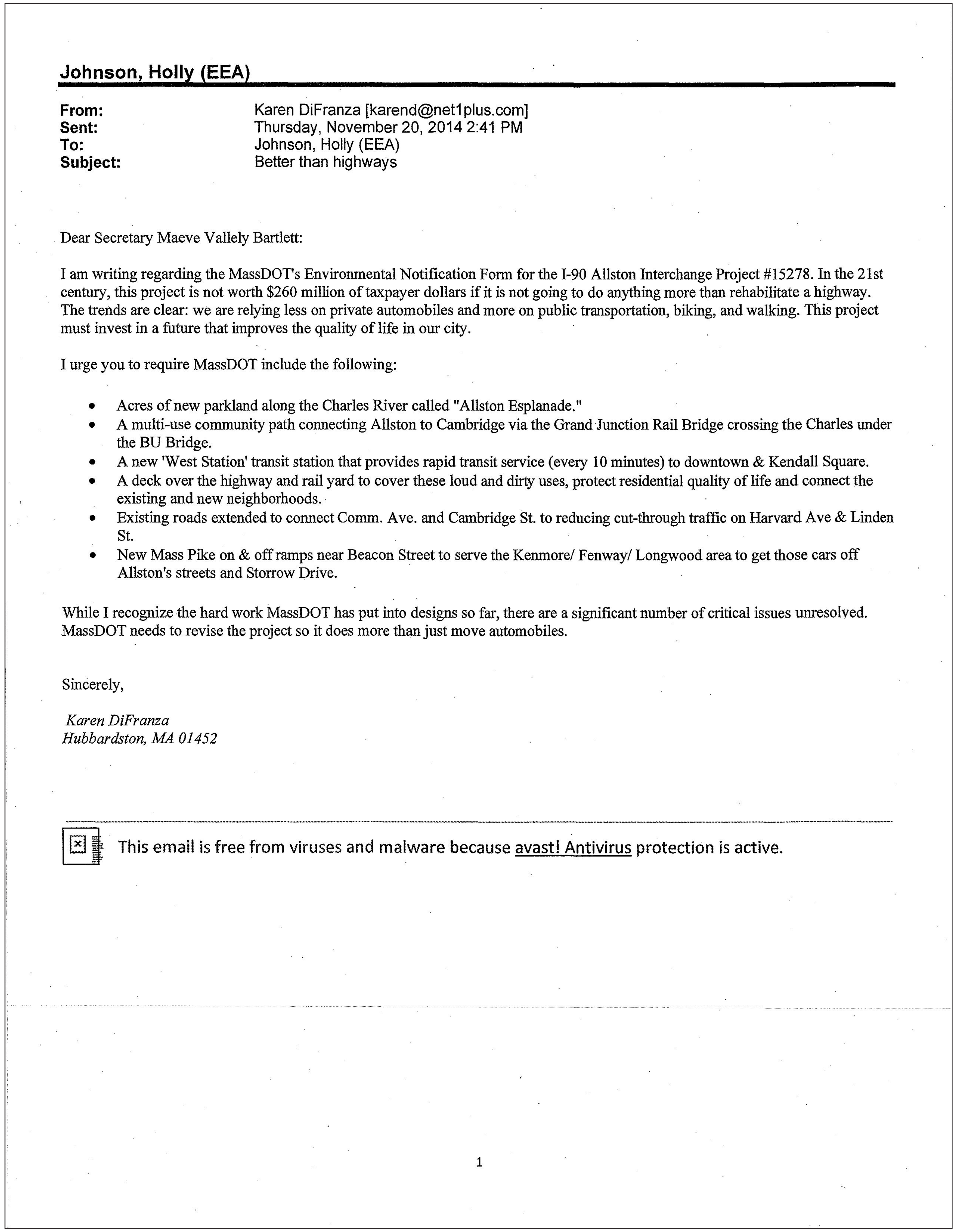
I urge you to require MassDOT include the following: JF-1

- Encourage high-density housing development to help address housing affordability issues. JF-1a
- Acres of new parkland along the Charles River called "Allston Esplanade." JF-1b
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge. JF-1c
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square. JF-1d
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods. JF-1e
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St. JF-1f
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive. JF-1g

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

James Fogel
Cambridge MA



Johnson, Holly (EEA)

From: Karen DiFranza [karend@net1plus.com]
Sent: Thursday, November 20, 2014 2:41 PM
To: Johnson, Holly (EEA)
Subject: Better than highways

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
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- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
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While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Karen DiFranza
Hubbardston, MA 01452

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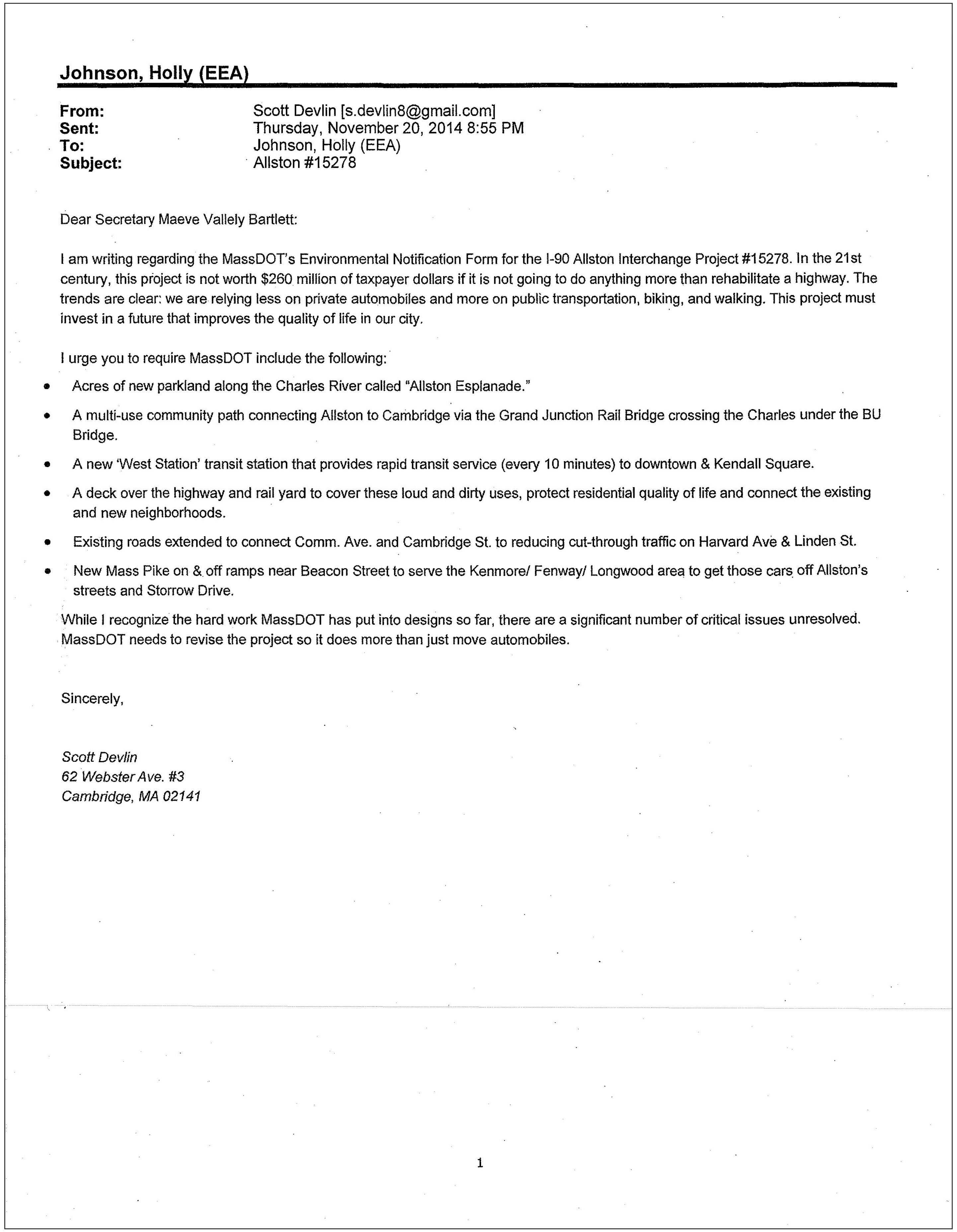

Johnson, Holly (EEA)

From: Scott Devlin [s.devlin8@gmail.com]
Sent: Thursday, November 20, 2014 8:55 PM
To: Johnson, Holly (EEA)
Subject: Allston #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
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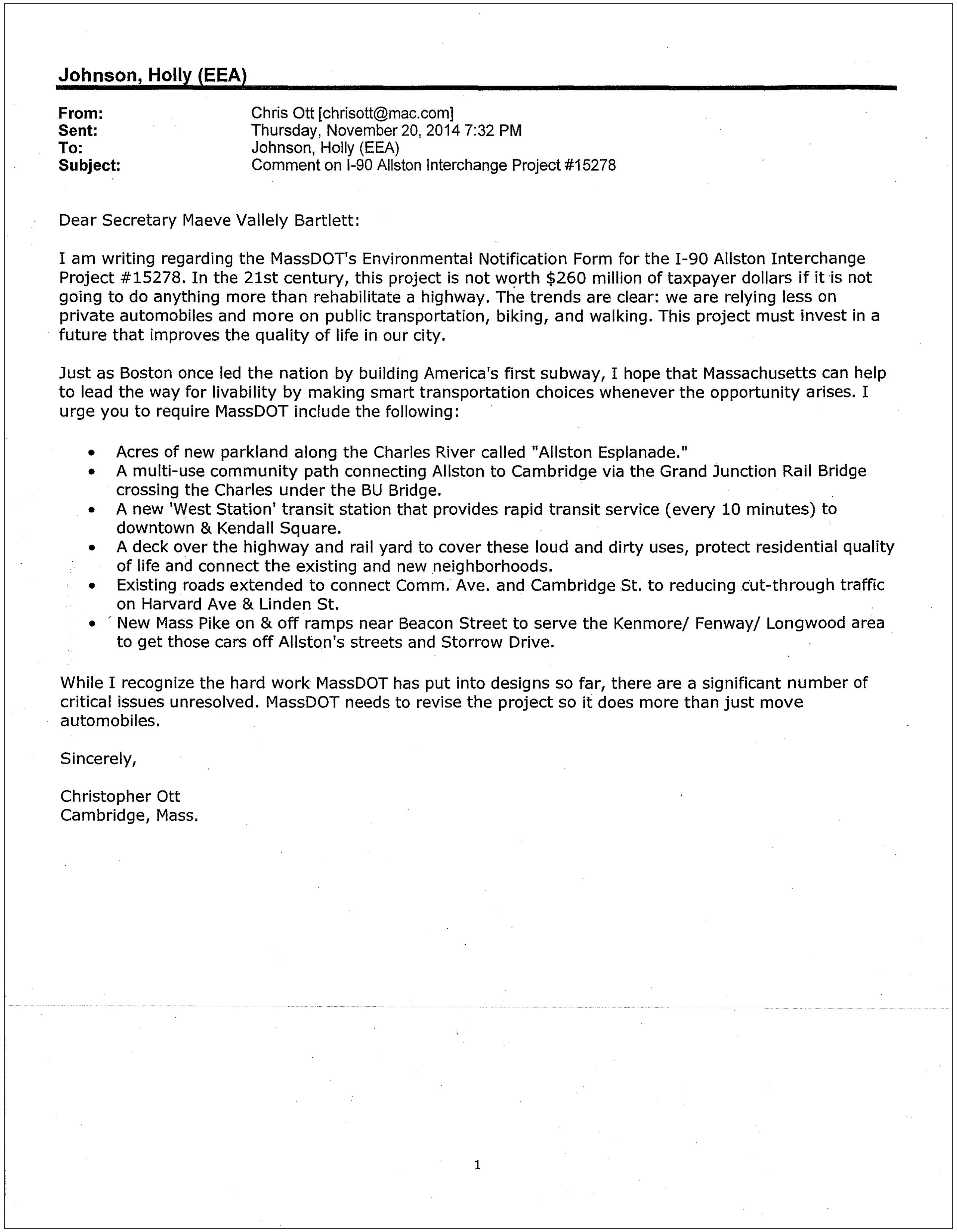
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Scott Devlin
62 Webster Ave. #3
Cambridge, MA 02141

1



Johnson, Holly (EEA)

From: Chris Ott [chrisott@mac.com]
Sent: Thursday, November 20, 2014 7:32 PM
To: Johnson, Holly (EEA)
Subject: Comment on I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

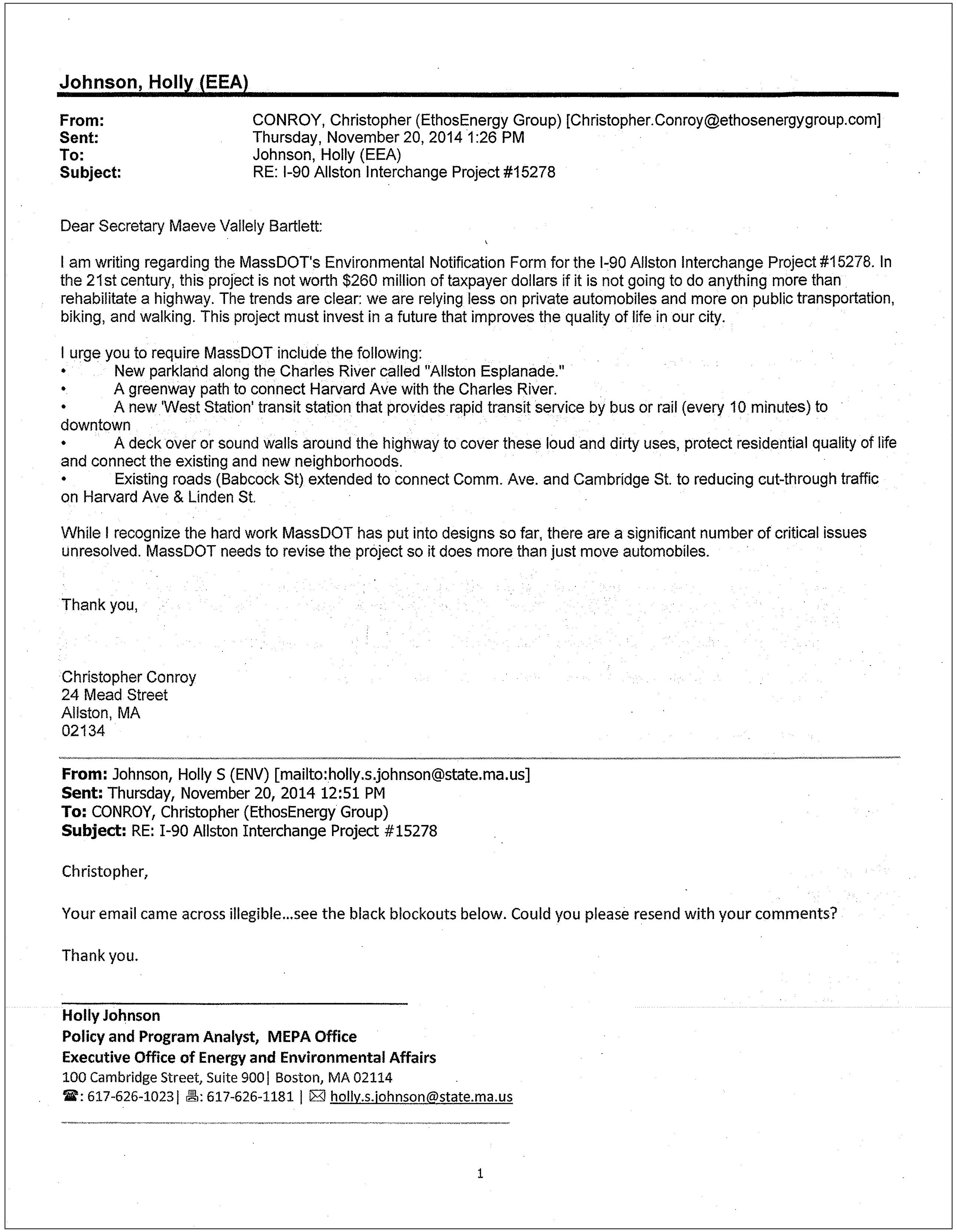
Just as Boston once led the nation by building America's first subway, I hope that Massachusetts can help to lead the way for livability by making smart transportation choices whenever the opportunity arises. I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Christopher Ott
Cambridge, Mass.



Johnson, Holly (EEA)

From: CONROY, Christopher (EthosEnergy Group) [Christopher.Conroy@ethosenergygroup.com]
Sent: Thursday, November 20, 2014 1:26 PM
To: Johnson, Holly (EEA)
Subject: RE: I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:
- New parkland along the Charles River called "Allston Esplanade."
- A greenway path to connect Harvard Ave with the Charles River.
- A new 'West Station' transit station that provides rapid transit service by bus or rail (every 10 minutes) to downtown
- A deck over or sound walls around the highway to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads (Babcock St) extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Thank you,

Christopher Conroy
24 Mead Street
Allston, MA
02134

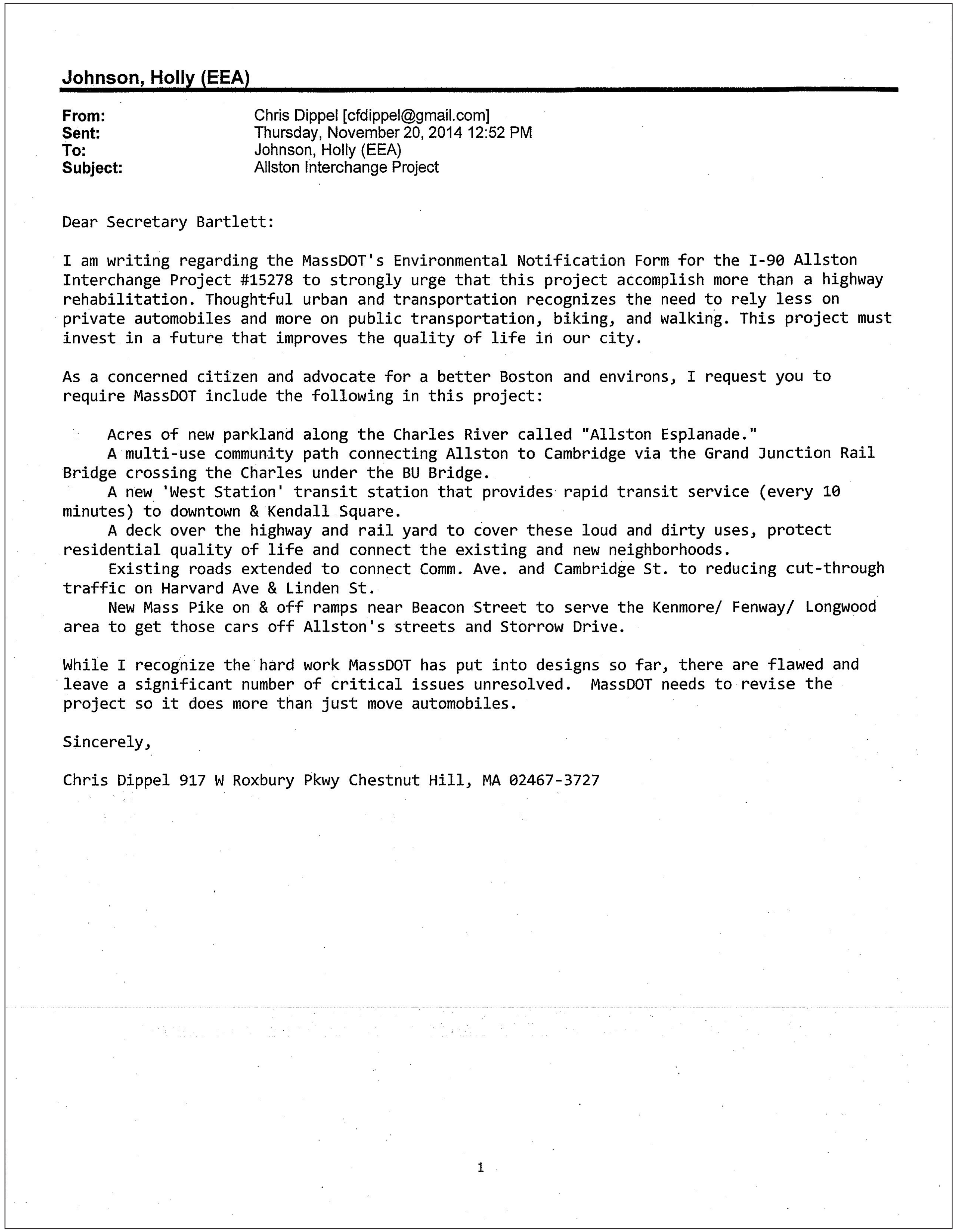
From: Johnson, Holly S (ENV) [mailto:holly.s.johnson@state.ma.us]
Sent: Thursday, November 20, 2014 12:51 PM
To: CONROY, Christopher (EthosEnergy Group)
Subject: RE: I-90 Allston Interchange Project #15278

Christopher,

Your email came across illegible…see the black blockouts below. Could you please resend with your comments?

Thank you.

Holly Johnson
Policy and Program Analyst, MEPA Office
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900| Boston, MA 02114
☎: 617-626-1023| 🖷: 617-626-1181 | ✉ holly.s.johnson@state.ma.us



Johnson, Holly (EEA)

From: Chris Dippel [cfdippel@gmail.com]
Sent: Thursday, November 20, 2014 12:52 PM
To: Johnson, Holly (EEA)
Subject: Allston Interchange Project

Dear Secretary Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278 to strongly urge that this project accomplish more than a highway rehabilitation. Thoughtful urban and transportation recognizes the need to rely less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

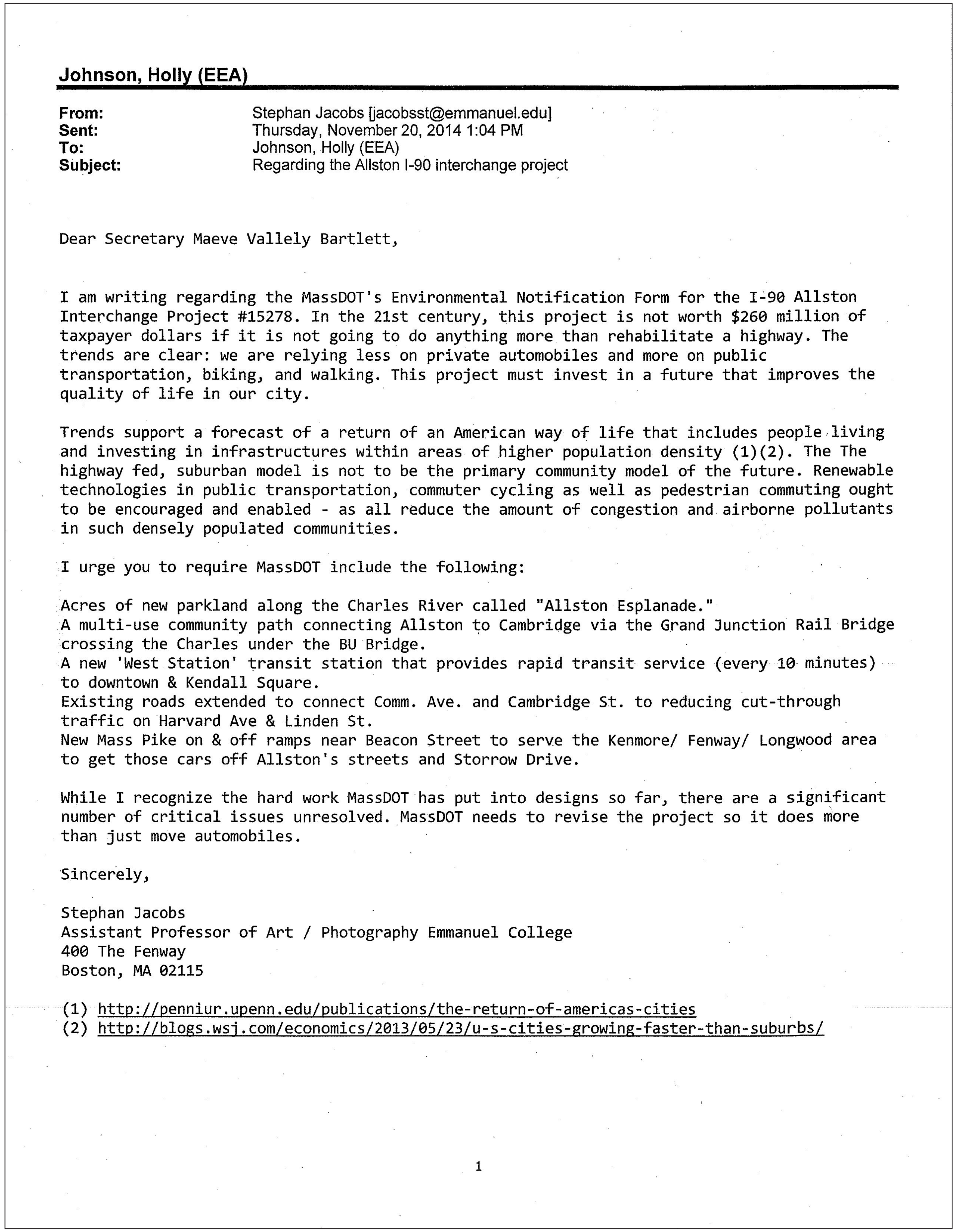
As a concerned citizen and advocate for a better Boston and environs, I request you to require MassDOT include the following in this project:

Acres of new parkland along the Charles River called "Allston Esplanade."
A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are flawed and leave a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Chris Dippel 917 W Roxbury Pkwy Chestnut Hill, MA 02467-3727



Johnson, Holly (EEA)

From: Stephan Jacobs [jacobsst@emmanuel.edu]
Sent: Thursday, November 20, 2014 1:04 PM
To: Johnson, Holly (EEA)
Subject: Regarding the Allston I-90 interchange project

Dear Secretary Maeve Vallely Bartlett,

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

Trends support a forecast of a return of an American way of life that includes people living and investing in infrastructures within areas of higher population density (1)(2). The The highway fed, suburban model is not to be the primary community model of the future. Renewable technologies in public transportation, commuter cycling as well as pedestrian commuting ought to be encouraged and enabled - as all reduce the amount of congestion and airborne pollutants in such densely populated communities.

I urge you to require MassDOT include the following:

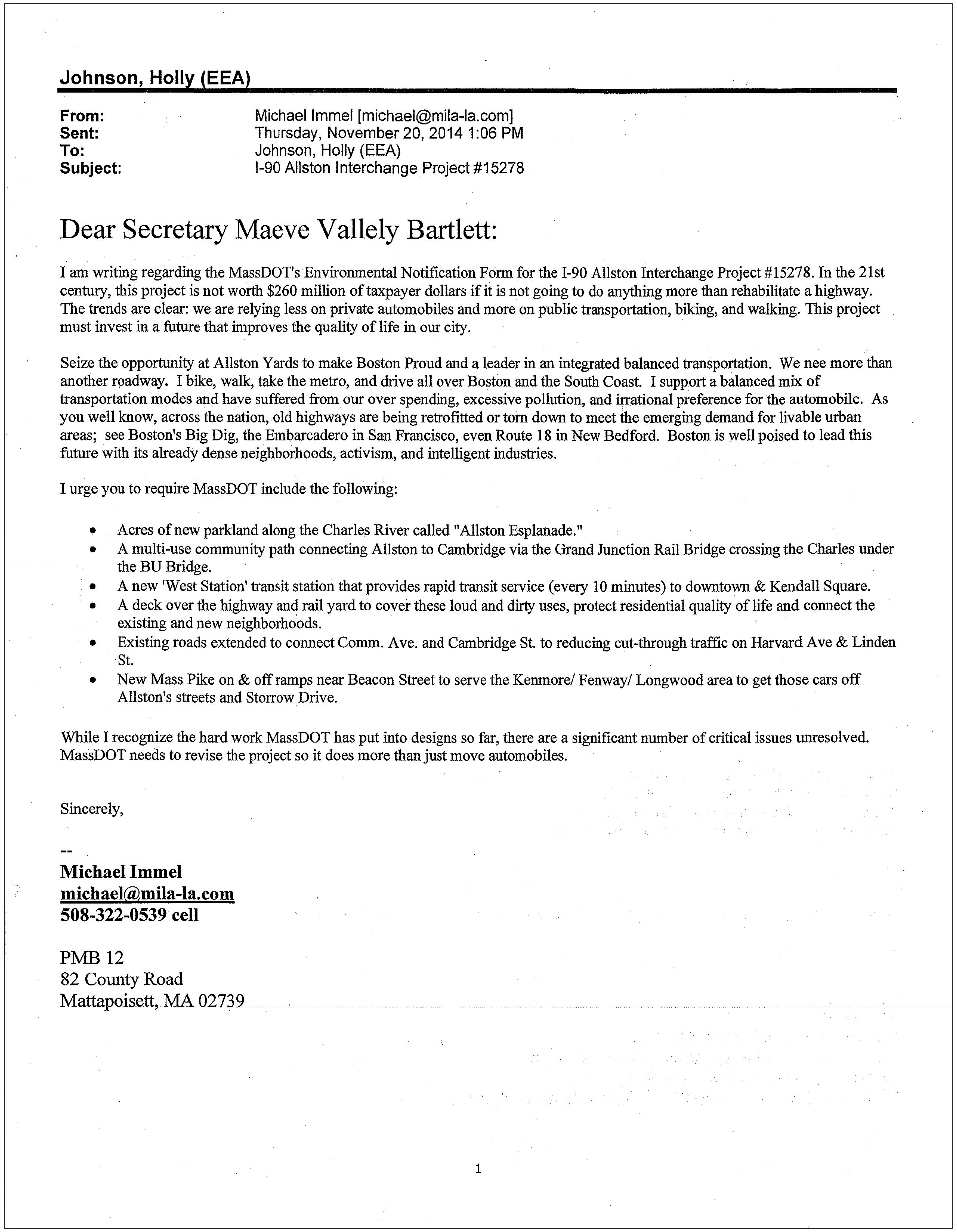
Acres of new parkland along the Charles River called "Allston Esplanade."
A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Stephan Jacobs
Assistant Professor of Art / Photography Emmanuel College
400 The Fenway
Boston, MA 02115

(1) http://penniur.upenn.edu/publications/the-return-of-americas-cities
(2) http://blogs.wsj.com/economics/2013/05/23/u-s-cities-growing-faster-than-suburbs/



Johnson, Holly (EEA)

From: Michael Immel [michael@mila-la.com]
Sent: Thursday, November 20, 2014 1:06 PM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

Seize the opportunity at Allston Yards to make Boston Proud and a leader in an integrated balanced transportation. We nee more than another roadway. I bike, walk, take the metro, and drive all over Boston and the South Coast. I support a balanced mix of transportation modes and have suffered from our over spending, excessive pollution, and irrational preference for the automobile. As you well know, across the nation, old highways are being retrofitted or torn down to meet the emerging demand for livable urban areas; see Boston's Big Dig, the Embarcadero in San Francisco, even Route 18 in New Bedford. Boston is well poised to lead this future with its already dense neighborhoods, activism, and intelligent industries.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

--
Michael Immel
michael@mila-la.com
508-322-0539 cell

PMB 12
82 County Road
Mattapoisett, MA 02739

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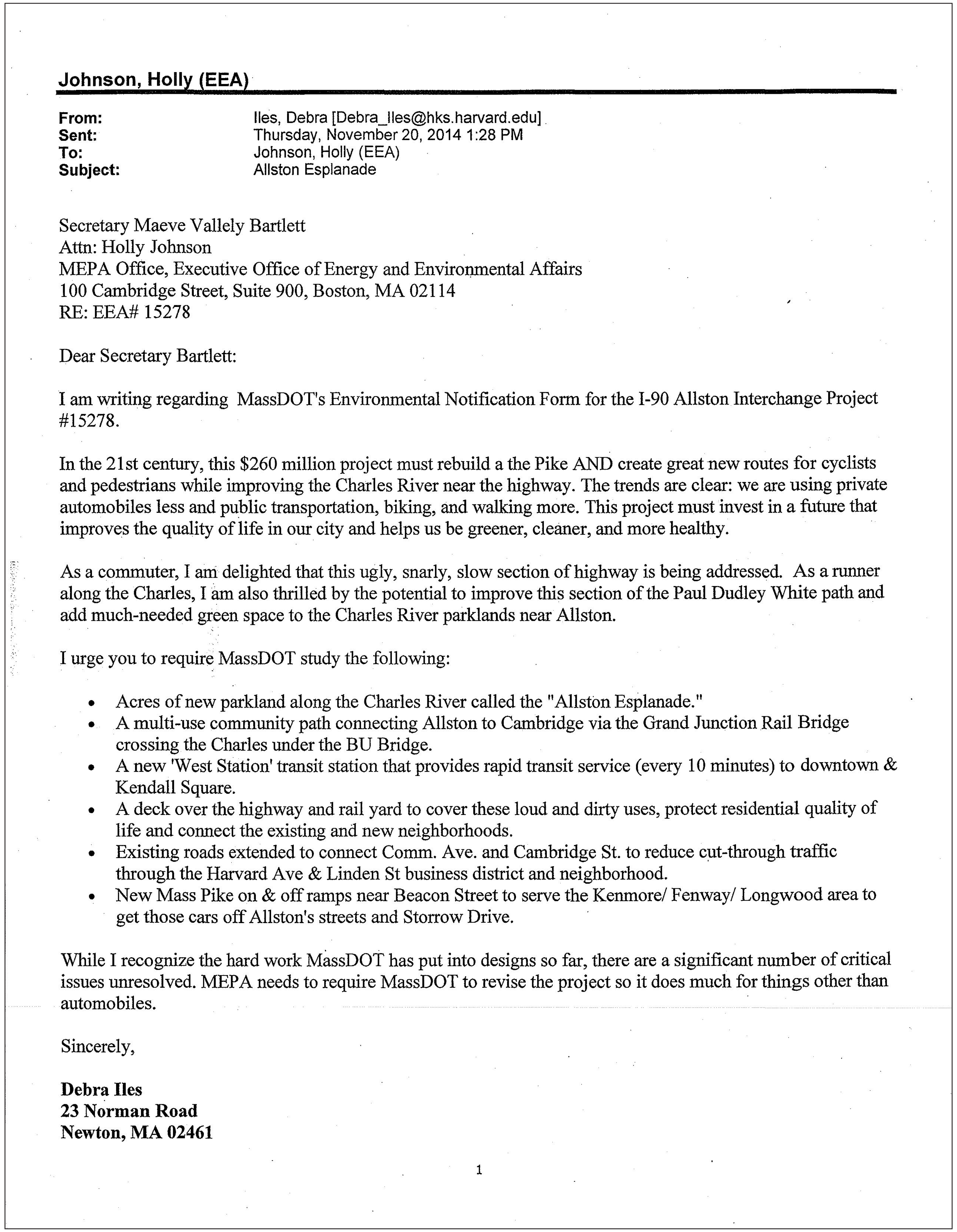


Johnson, Holly (EEA)

From: Iles, Debra [Debra_Iles@hks.harvard.edu]
Sent: Thursday, November 20, 2014 1:28 PM
To: Johnson, Holly (EEA)
Subject: Allston Esplanade

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

As a commuter, I am delighted that this ugly, snarly, slow section of highway is being addressed. As a runner along the Charles, I am also thrilled by the potential to improve this section of the Paul Dudley White path and add much-needed green space to the Charles River parklands near Allston.

I urge you to require MassDOT study the following:

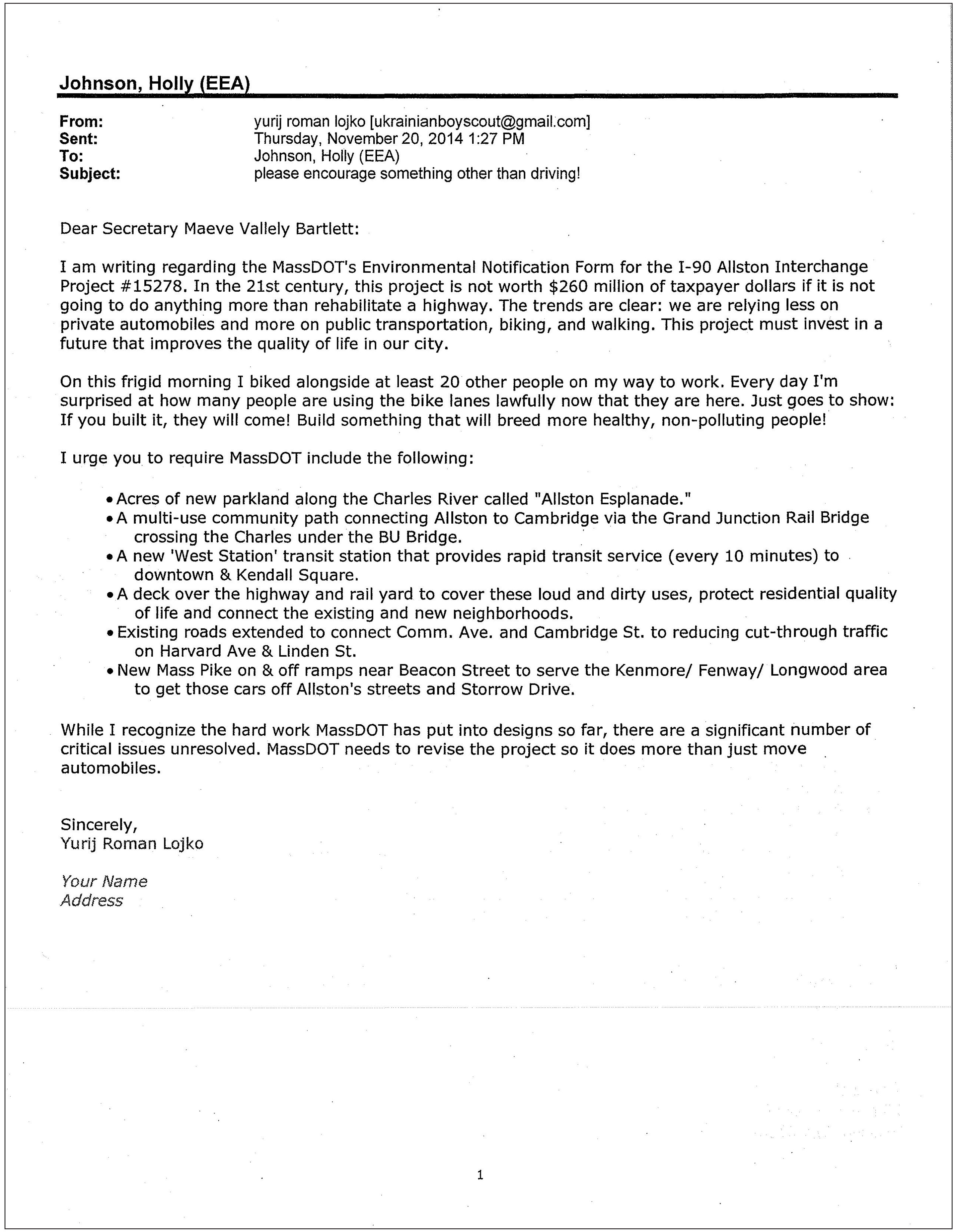
- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,

Debra Iles
23 Norman Road
Newton, MA 02461

1



Johnson, Holly (EEA)

From: yurij roman lojko [ukrainianboyscout@gmail.com]
Sent: Thursday, November 20, 2014 1:27 PM
To: Johnson, Holly (EEA)
Subject: please encourage something other than driving!

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

On this frigid morning I biked alongside at least 20 other people on my way to work. Every day I'm surprised at how many people are using the bike lanes lawfully now that they are here. Just goes to show: If you built it, they will come! Build something that will breed more healthy, non-polluting people!

I urge you to require MassDOT include the following:

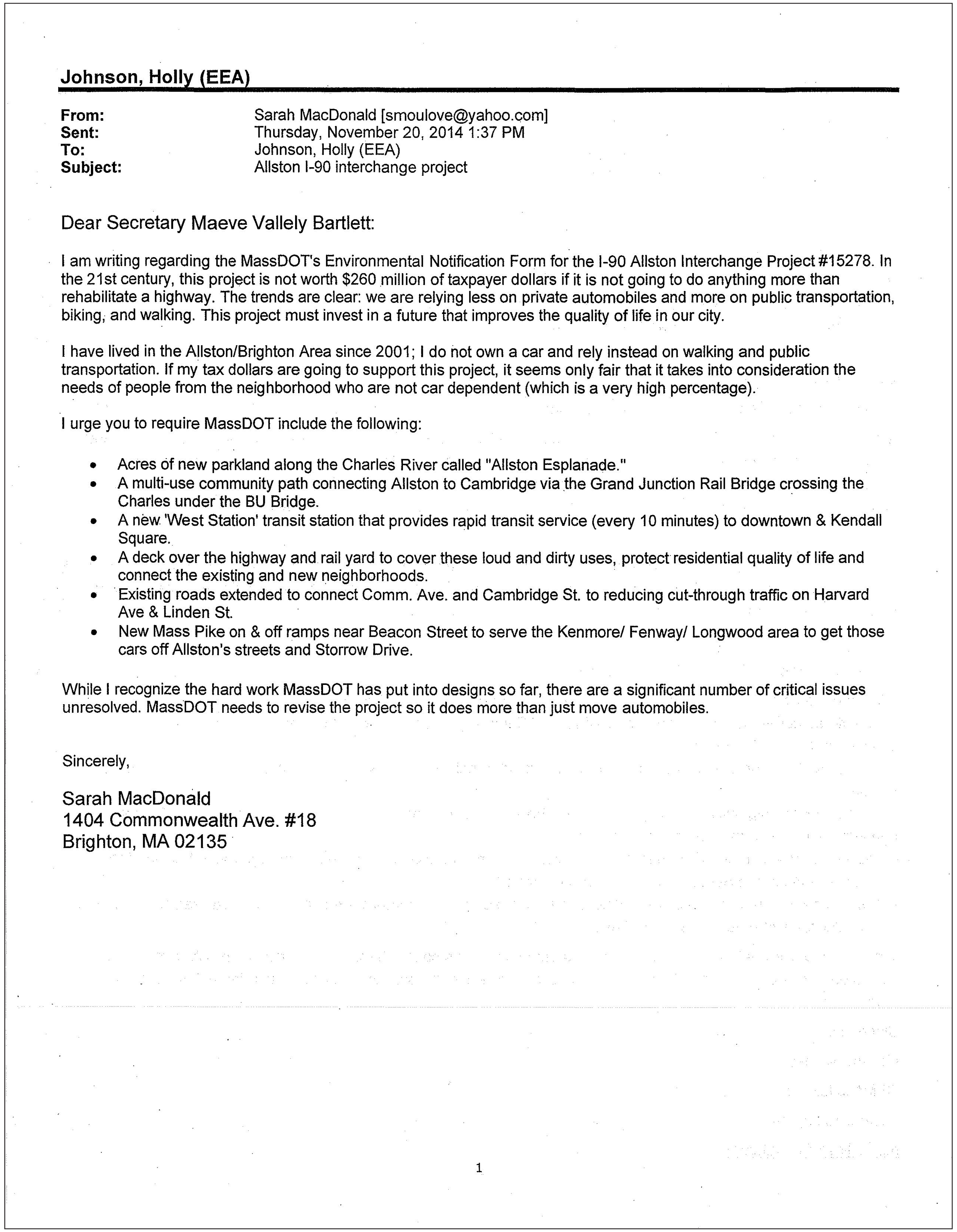
- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,
Yurij Roman Lojko

Your Name
Address

1



Johnson, Holly (EEA)

From: Sarah MacDonald [smoulove@yahoo.com]
Sent: Thursday, November 20, 2014 1:37 PM
To: Johnson, Holly (EEA)
Subject: Allston I-90 interchange project

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I have lived in the Allston/Brighton Area since 2001; I do not own a car and rely instead on walking and public transportation. If my tax dollars are going to support this project, it seems only fair that it takes into consideration the needs of people from the neighborhood who are not car dependent (which is a very high percentage).

I urge you to require MassDOT include the following:

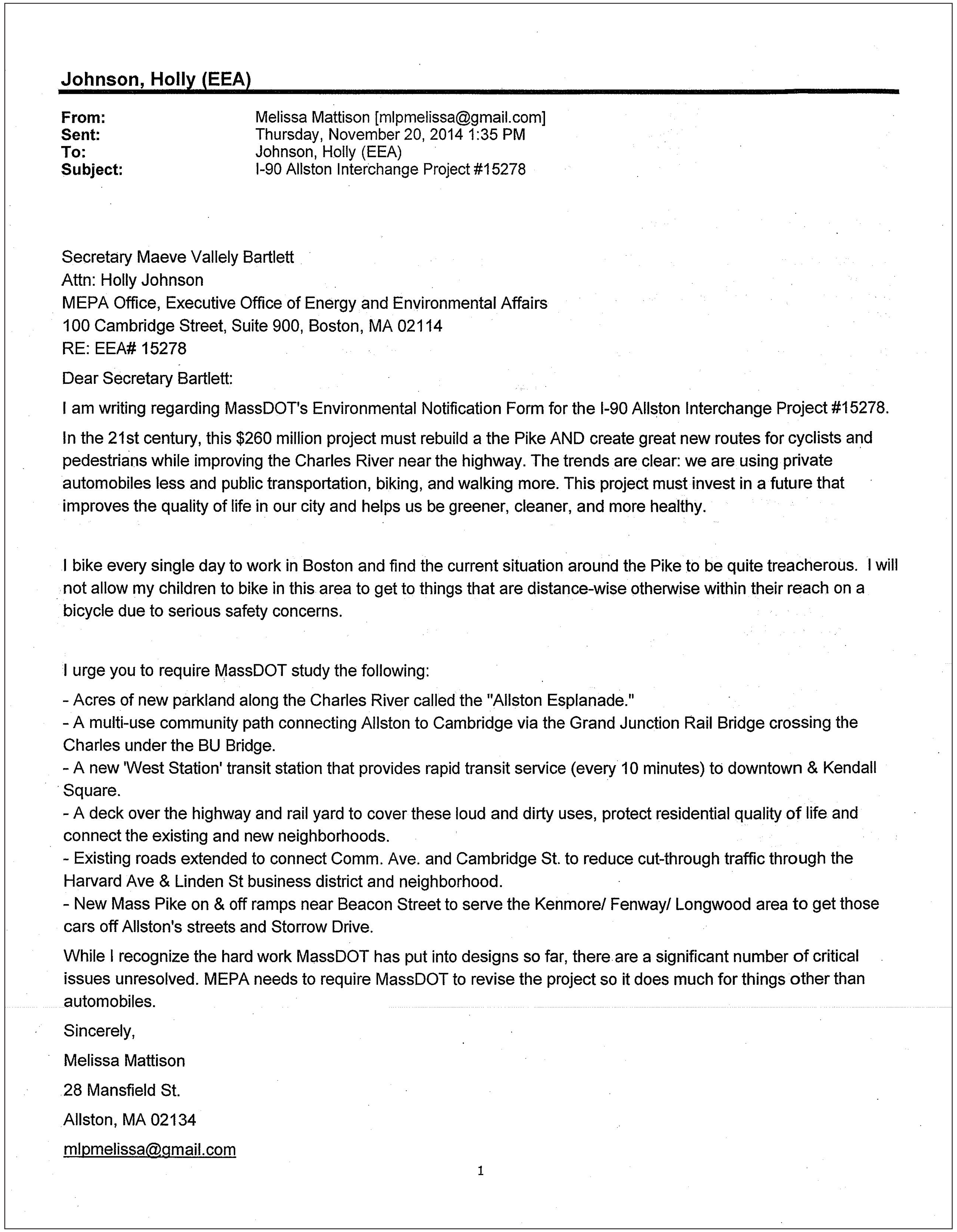
- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Sarah MacDonald
1404 Commonwealth Ave. #18
Brighton, MA 02135

1



Johnson, Holly (EEA)

From: Melissa Mattison [mlpmelissa@gmail.com]
Sent: Thursday, November 20, 2014 1:35 PM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange Project #15278

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

I bike every single day to work in Boston and find the current situation around the Pike to be quite treacherous. I will not allow my children to bike in this area to get to things that are distance-wise otherwise within their reach on a bicycle due to serious safety concerns.

I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,

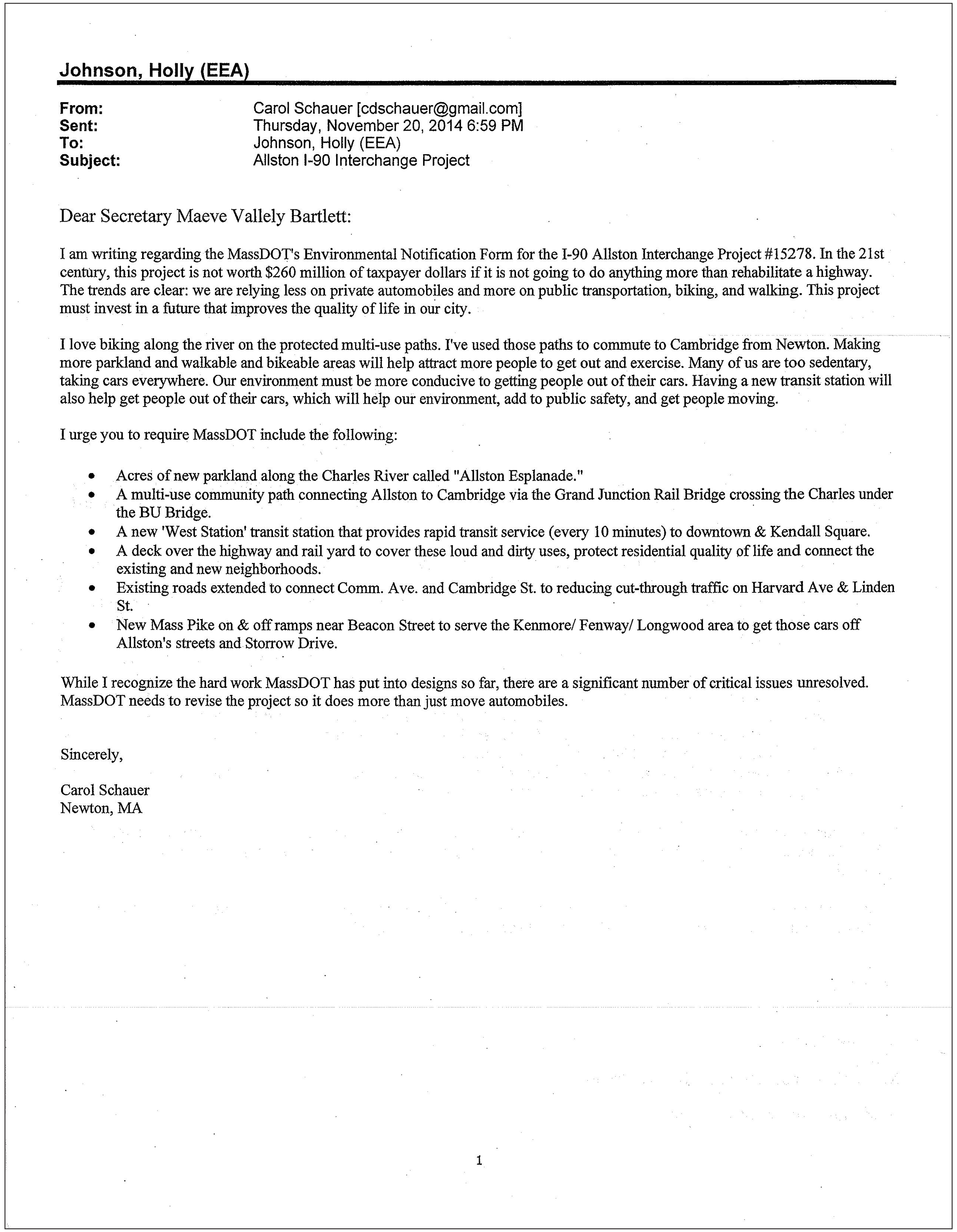
Melissa Mattison

28 Mansfield St.

Allston, MA 02134

mlpmelissa@gmail.com

1



Johnson, Holly (EEA)

From: Carol Schauer [cdschauer@gmail.com]
Sent: Thursday, November 20, 2014 6:59 PM
To: Johnson, Holly (EEA)
Subject: Allston I-90 Interchange Project

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I love biking along the river on the protected multi-use paths. I've used those paths to commute to Cambridge from Newton. Making more parkland and walkable and bikeable areas will help attract more people to get out and exercise. Many of us are too sedentary, taking cars everywhere. Our environment must be more conducive to getting people out of their cars. Having a new transit station will also help get people out of their cars, which will help our environment, add to public safety, and get people moving.

I urge you to require MassDOT include the following:

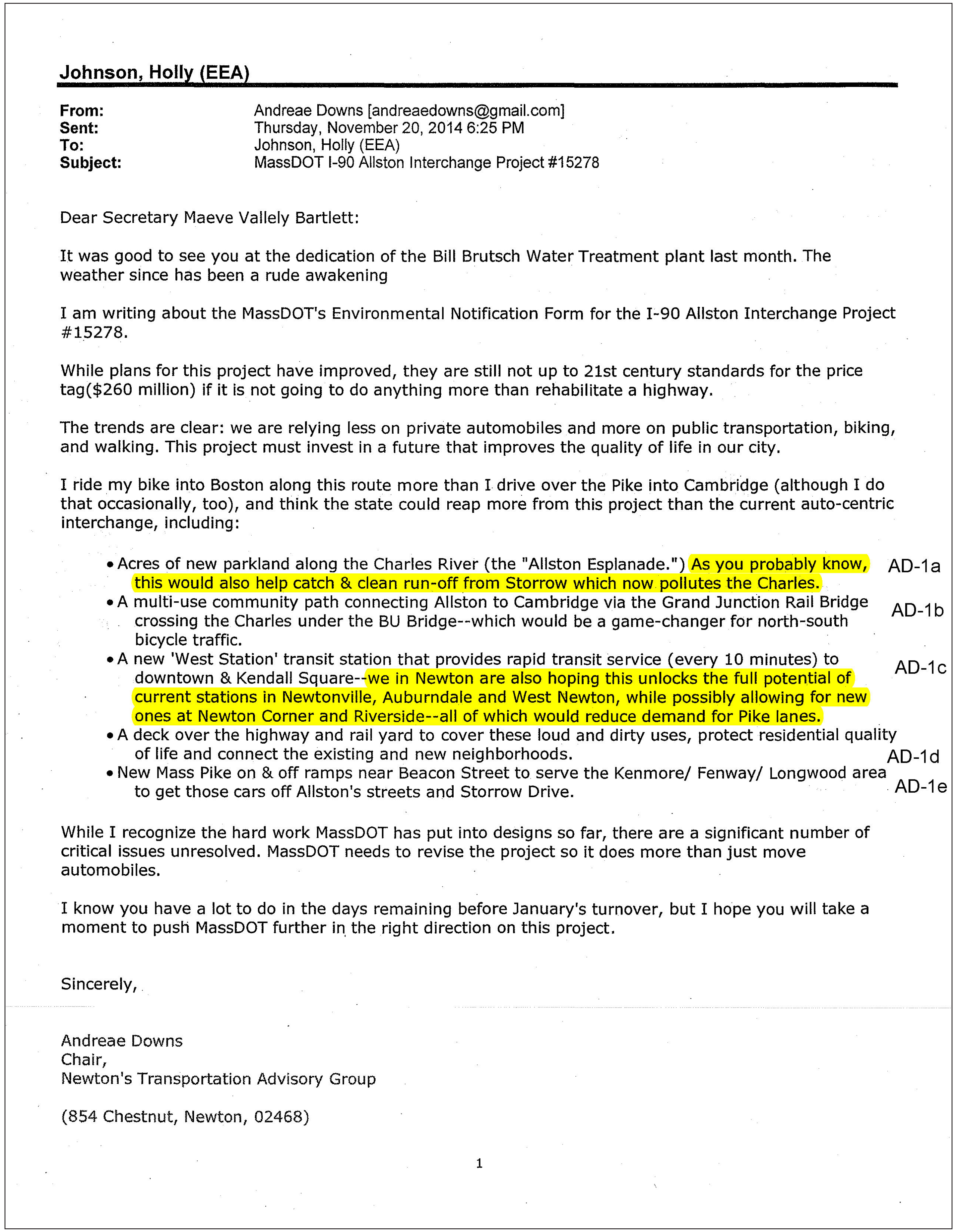
- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Carol Schauer
Newton, MA

1



Johnson, Holly (EEA)

From: Andreae Downs [andreaedowns@gmail.com]
Sent: Thursday, November 20, 2014 6:25 PM
To: Johnson, Holly (EEA)
Subject: MassDOT I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

It was good to see you at the dedication of the Bill Brutsch Water Treatment plant last month. The weather since has been a rude awakening

I am writing about the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

While plans for this project have improved, they are still not up to 21st century standards for the price tag($260 million) if it is not going to do anything more than rehabilitate a highway.

The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I ride my bike into Boston along this route more than I drive over the Pike into Cambridge (although I do that occasionally, too), and think the state could reap more from this project than the current auto-centric interchange, including:

- Acres of new parkland along the Charles River (the "Allston Esplanade.") As you probably know, this would also help catch & clean run-off from Storrow which now pollutes the Charles. AD-1a
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge--which would be a game-changer for north-south bicycle traffic. AD-1b
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square--we in Newton are also hoping this unlocks the full potential of current stations in Newtonville, Auburndale and West Newton, while possibly allowing for new ones at Newton Corner and Riverside--all of which would reduce demand for Pike lanes. AD-1c
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods. AD-1d
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive. AD-1e

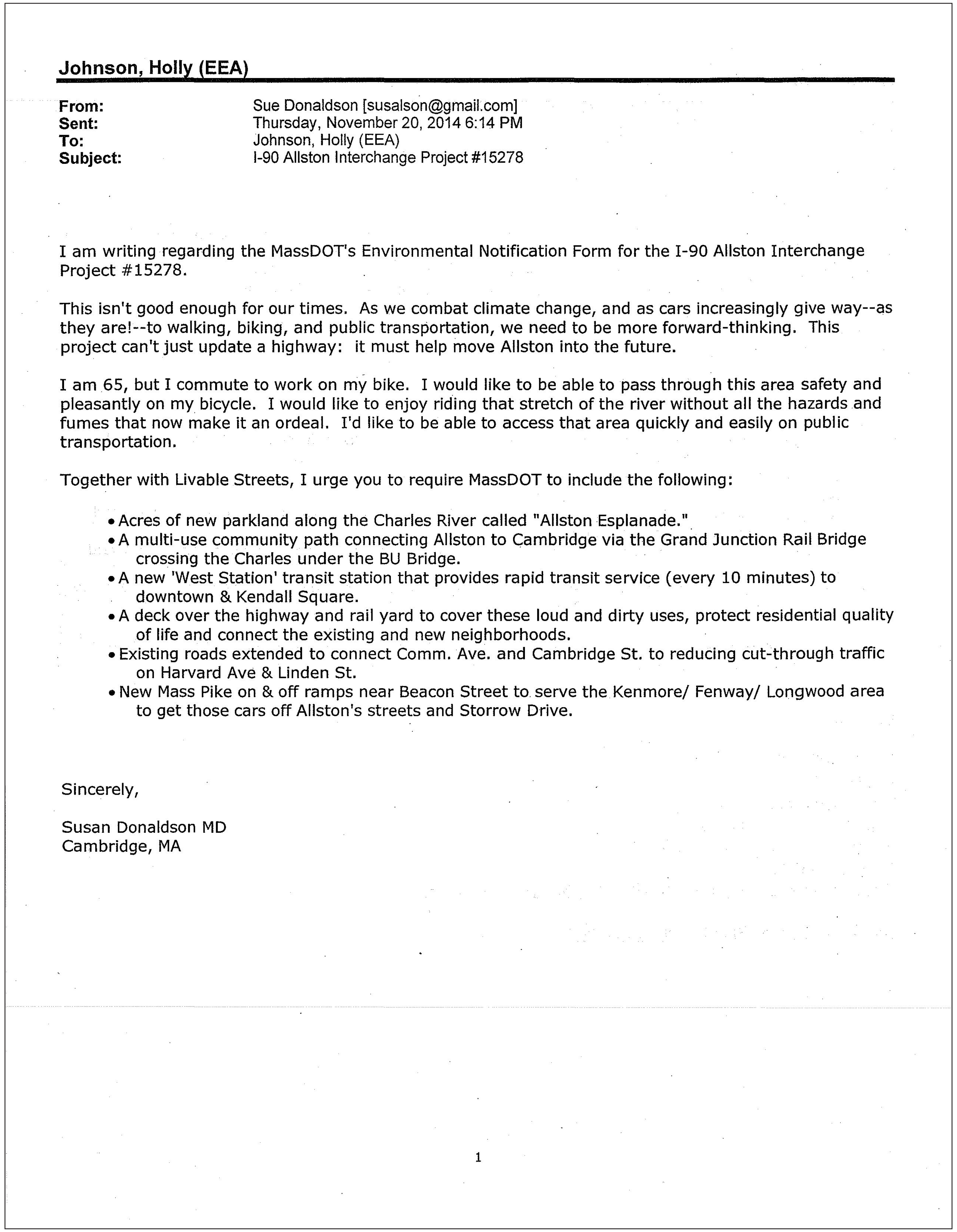
While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

I know you have a lot to do in the days remaining before January's turnover, but I hope you will take a moment to push MassDOT further in the right direction on this project.

Sincerely,

Andreae Downs
Chair,
Newton's Transportation Advisory Group

(854 Chestnut, Newton, 02468)



Johnson, Holly (EEA)

From: Sue Donaldson [susalson@gmail.com]
Sent: Thursday, November 20, 2014 6:14 PM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange Project #15278

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

This isn't good enough for our times. As we combat climate change, and as cars increasingly give way--as they are!--to walking, biking, and public transportation, we need to be more forward-thinking. This project can't just update a highway: it must help move Allston into the future.

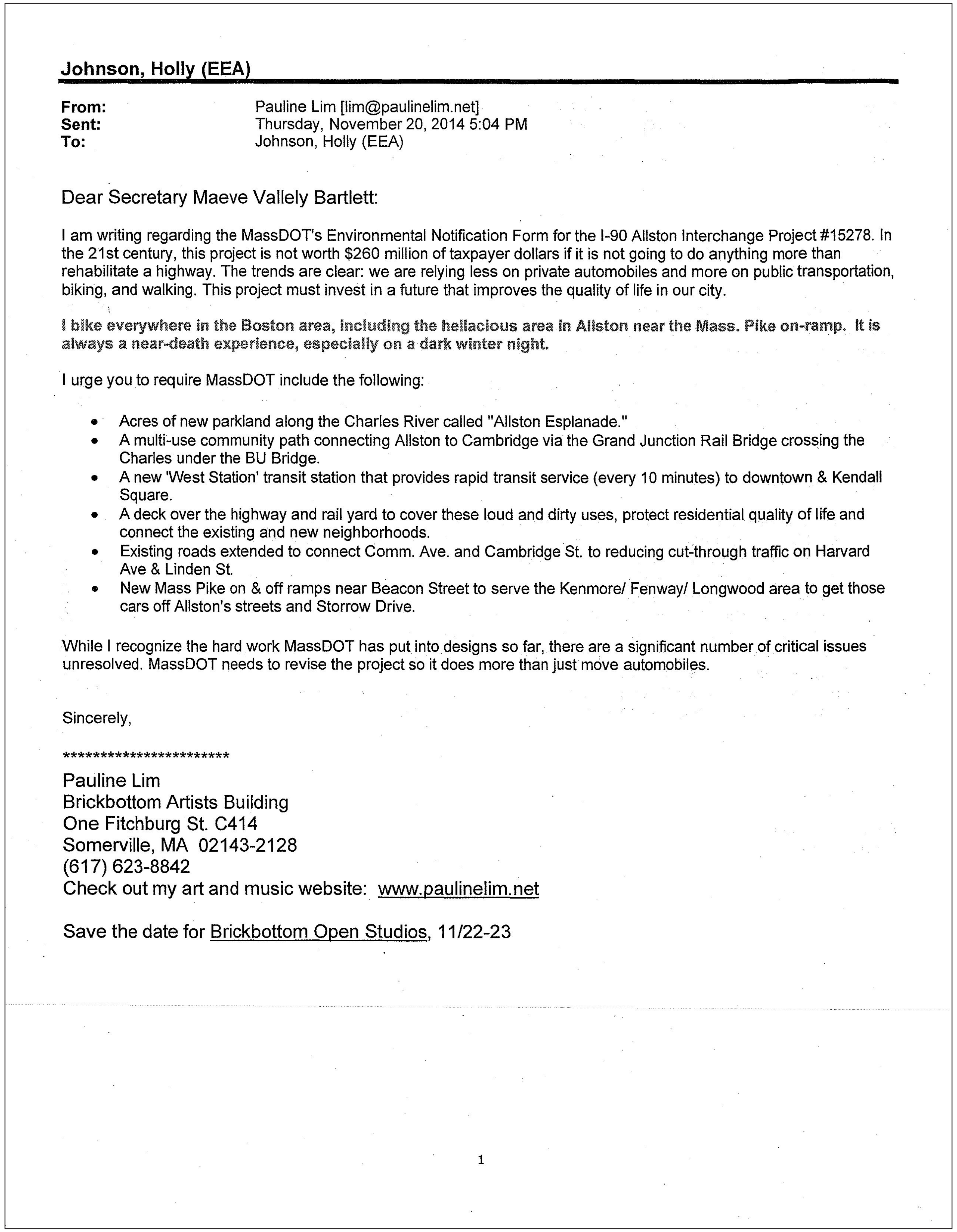
I am 65, but I commute to work on my bike. I would like to be able to pass through this area safety and pleasantly on my bicycle. I would like to enjoy riding that stretch of the river without all the hazards and fumes that now make it an ordeal. I'd like to be able to access that area quickly and easily on public transportation.

Together with Livable Streets, I urge you to require MassDOT to include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

Sincerely,

Susan Donaldson MD
Cambridge, MA



Johnson, Holly (EEA)

From: Pauline Lim [lim@paulinelim.net]
Sent: Thursday, November 20, 2014 5:04 PM
To: Johnson, Holly (EEA)

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I bike everywhere in the Boston area, including the hellacious area in Allston near the Mass. Pike on-ramp. It is always a near-death experience, especially on a dark winter night.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

****

Pauline Lim
Brickbottom Artists Building
One Fitchburg St. C414
Somerville, MA 02143-2128
(617) 623-8842
Check out my art and music website: www.paulinelim.net

Save the date for Brickbottom Open Studios, 11/22-23

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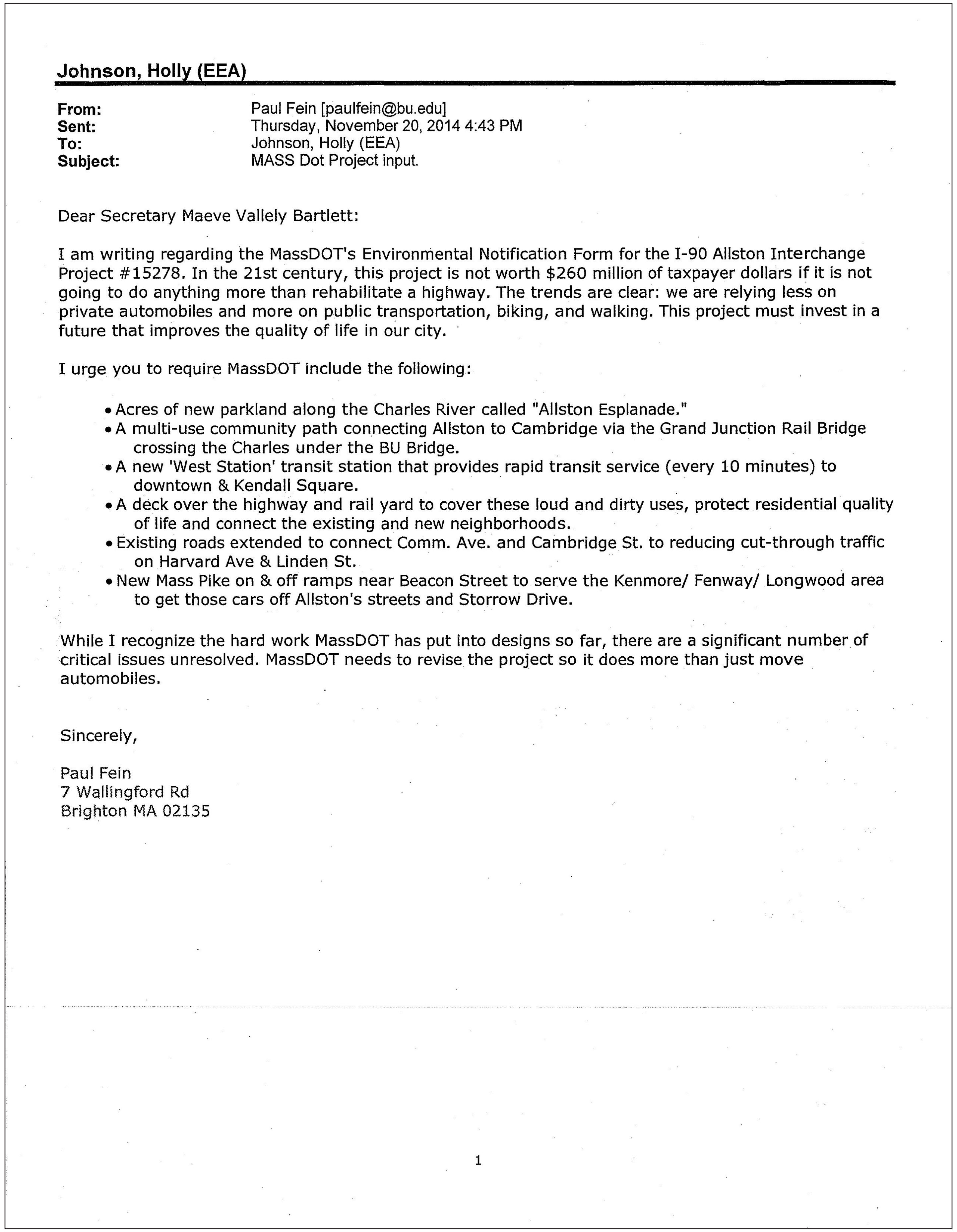

Johnson, Holly (EEA)

From: Paul Fein [paulfein@bu.edu]
Sent: Thursday, November 20, 2014 4:43 PM
To: Johnson, Holly (EEA)
Subject: MASS Dot Project input.

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Paul Fein
7 Wallingford Rd
Brighton MA 02135

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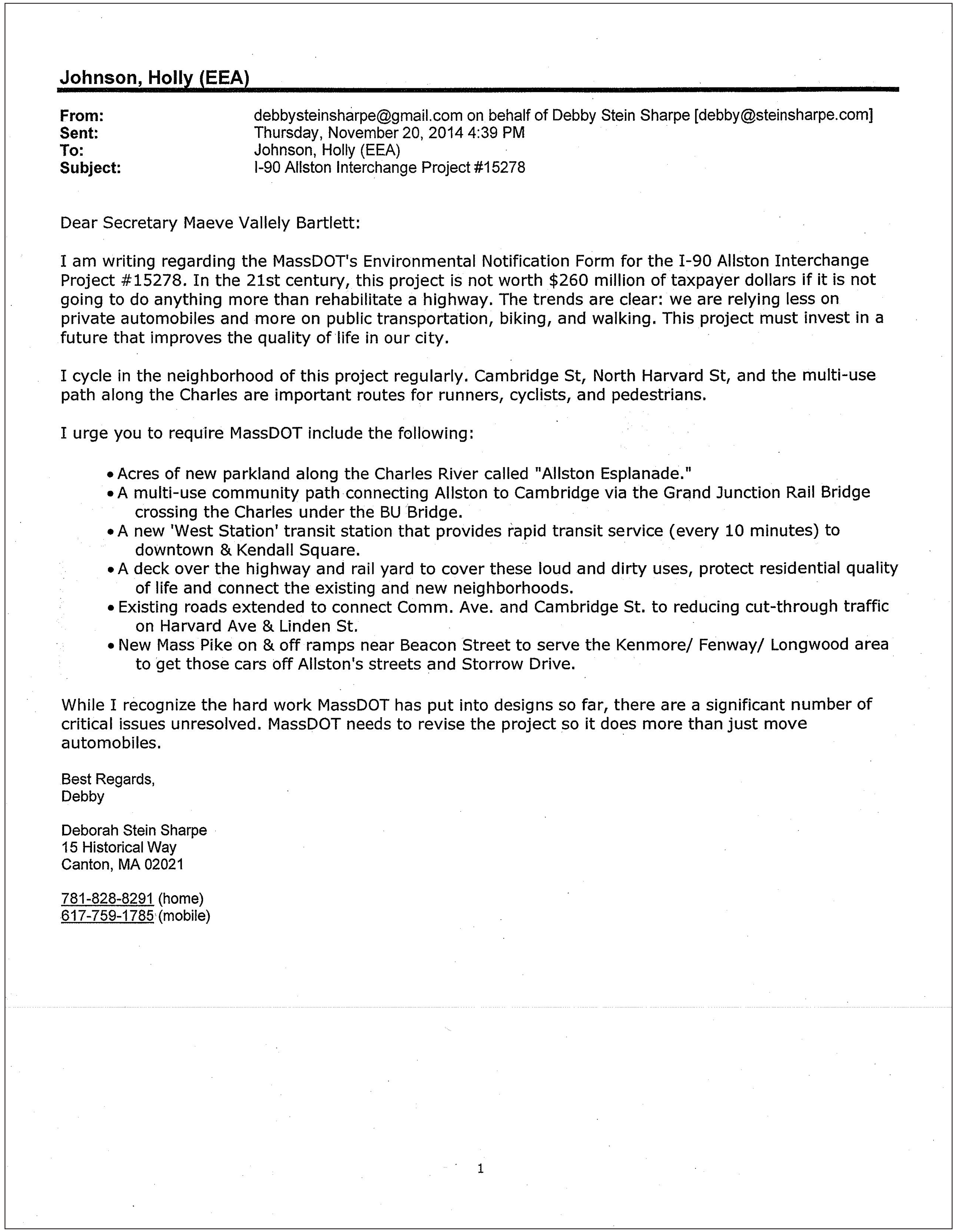


Johnson, Holly (EEA)

From: debbysteinsharpe@gmail.com on behalf of Debby Stein Sharpe [debby@steinsharpe.com]
Sent: Thursday, November 20, 2014 4:39 PM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I cycle in the neighborhood of this project regularly. Cambridge St, North Harvard St, and the multi-use path along the Charles are important routes for runners, cyclists, and pedestrians.

I urge you to require MassDOT include the following:

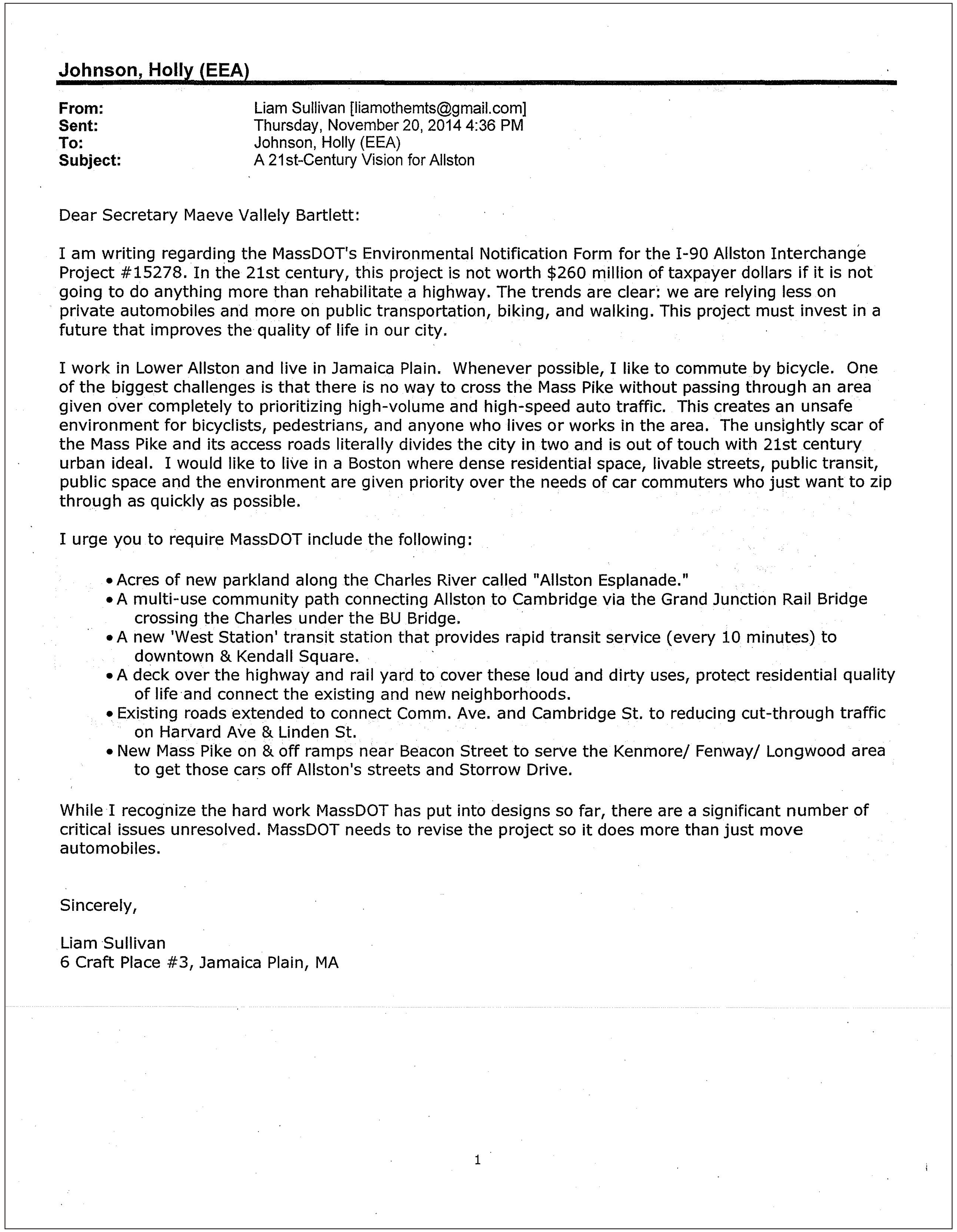
- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Best Regards,
Debby

Deborah Stein Sharpe
15 Historical Way
Canton, MA 02021

781-828-8291 (home)
617-759-1785 (mobile)



Johnson, Holly (EEA)

From: Liam Sullivan [liamothemts@gmail.com]
Sent: Thursday, November 20, 2014 4:36 PM
To: Johnson, Holly (EEA)
Subject: A 21st-Century Vision for Allston

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I work in Lower Allston and live in Jamaica Plain. Whenever possible, I like to commute by bicycle. One of the biggest challenges is that there is no way to cross the Mass Pike without passing through an area given over completely to prioritizing high-volume and high-speed auto traffic. This creates an unsafe environment for bicyclists, pedestrians, and anyone who lives or works in the area. The unsightly scar of the Mass Pike and its access roads literally divides the city in two and is out of touch with 21st century urban ideal. I would like to live in a Boston where dense residential space, livable streets, public transit, public space and the environment are given priority over the needs of car commuters who just want to zip through as quickly as possible.

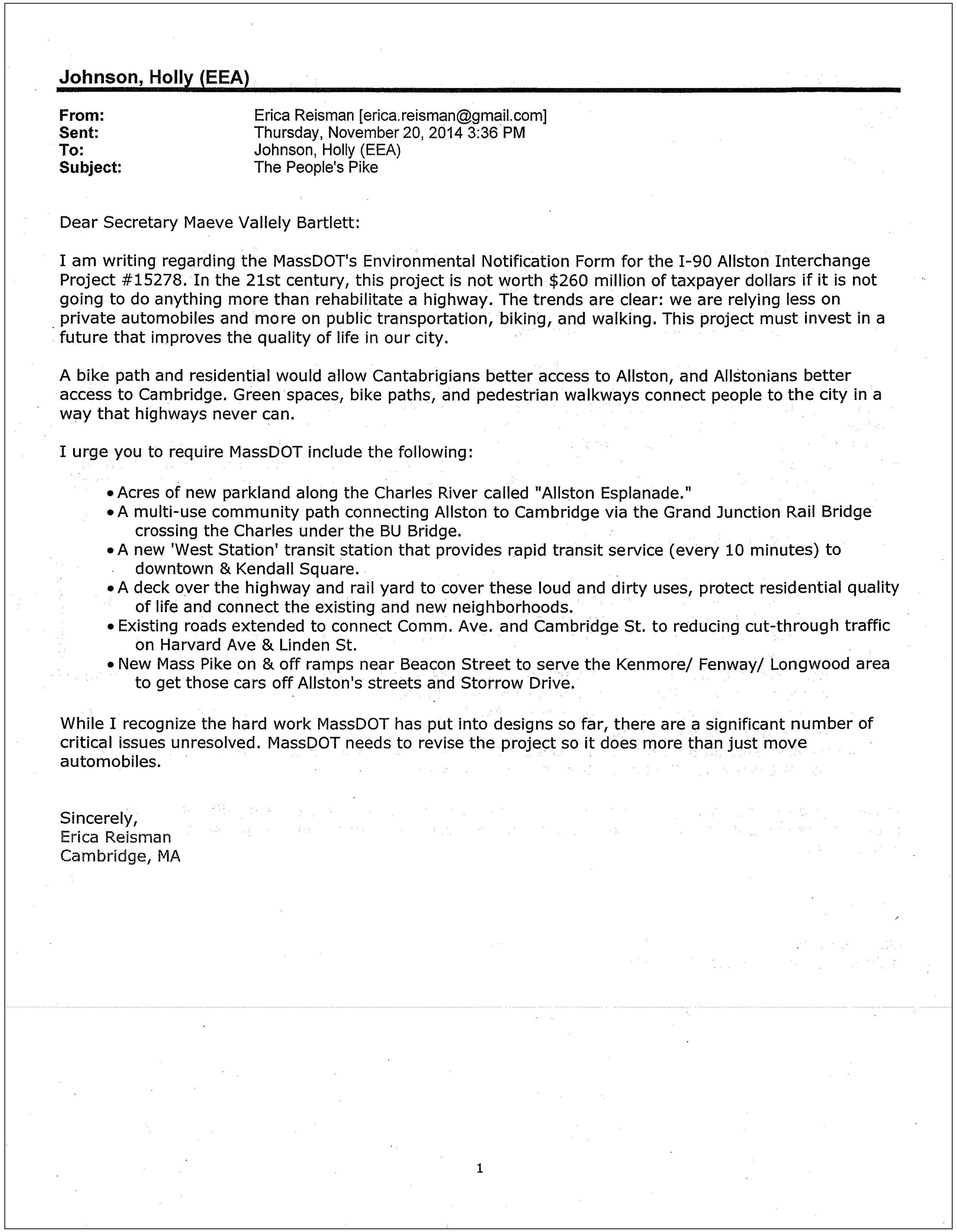
I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Liam Sullivan
6 Craft Place #3, Jamaica Plain, MA



Johnson, Holly (EEA)

From: Erica Reisman [erica.reisman@gmail.com]
Sent: Thursday, November 20, 2014 3:36 PM
To: Johnson, Holly (EEA)
Subject: The People's Pike

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

A bike path and residential would allow Cantabrigians better access to Allston, and Allstonians better access to Cambridge. Green spaces, bike paths, and pedestrian walkways connect people to the city in a way that highways never can.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,
Erica Reisman
Cambridge, MA

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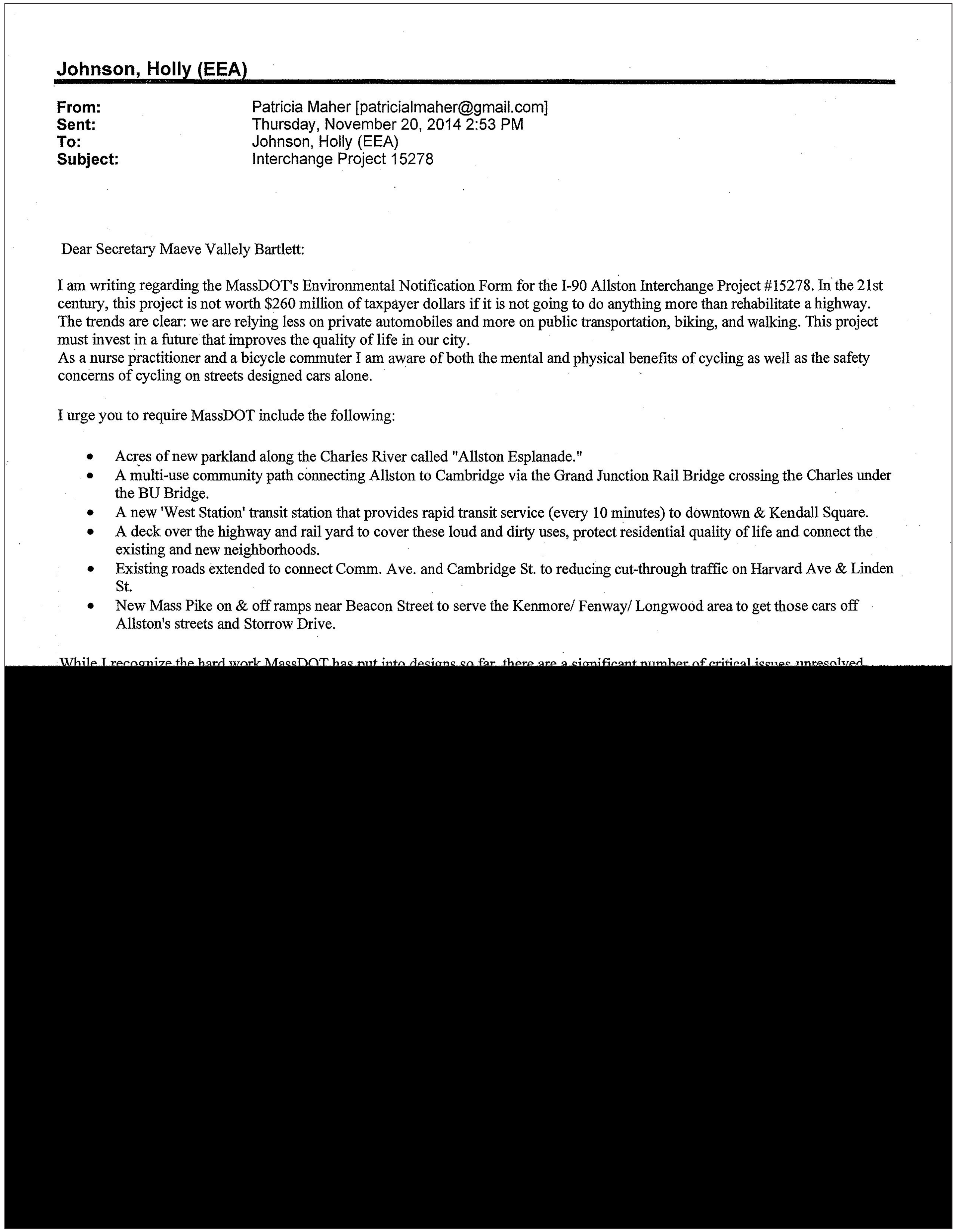


Johnson, Holly (EEA)

From: Patricia Maher [patricialmaher@gmail.com]
Sent: Thursday, November 20, 2014 2:53 PM
To: Johnson, Holly (EEA)
Subject: Interchange Project 15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.
As a nurse practitioner and a bicycle commuter I am aware of both the mental and physical benefits of cycling as well as the safety concerns of cycling on streets designed cars alone.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

[redacted]

Johnson, Holly (EEA)

From: Megan Ramey [megan@bikabout.com]
Sent: Thursday, November 20, 2014 12:38 PM
To: Johnson, Holly (EEA)
Subject: I want a family friendly and accessible Allston
Attachments: 1900633_10152402471228750_7687098416049509857_o (1).jpg; 10296142_10152436096843750_5089063141021638714_o.jpg

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

My 5 year old daughter, Annika (picture enclosed) just started biking to school everyday and on shorter rides on the weekends. We live in Western Cambridge and would love to bike to Allston, eat at their restaurants, play at their playgrounds, visit the library and farmers market. However, there is no accessible, family friendly way into Allson so we usually stick to the Charles River path on Cambridge-side. This is a huge missed economic opportunity for the local businesses of Allston.

Additionally, I know many parents who would love to bike with their children, but they are too scared to be next to cars along with trying to navigate huge, scary intersections.

My husband commutes to Genzyme Allston via a 10 minute bike ride and he has co-workers who would bike, walk or take the T to work if it was more accessible and convenient.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

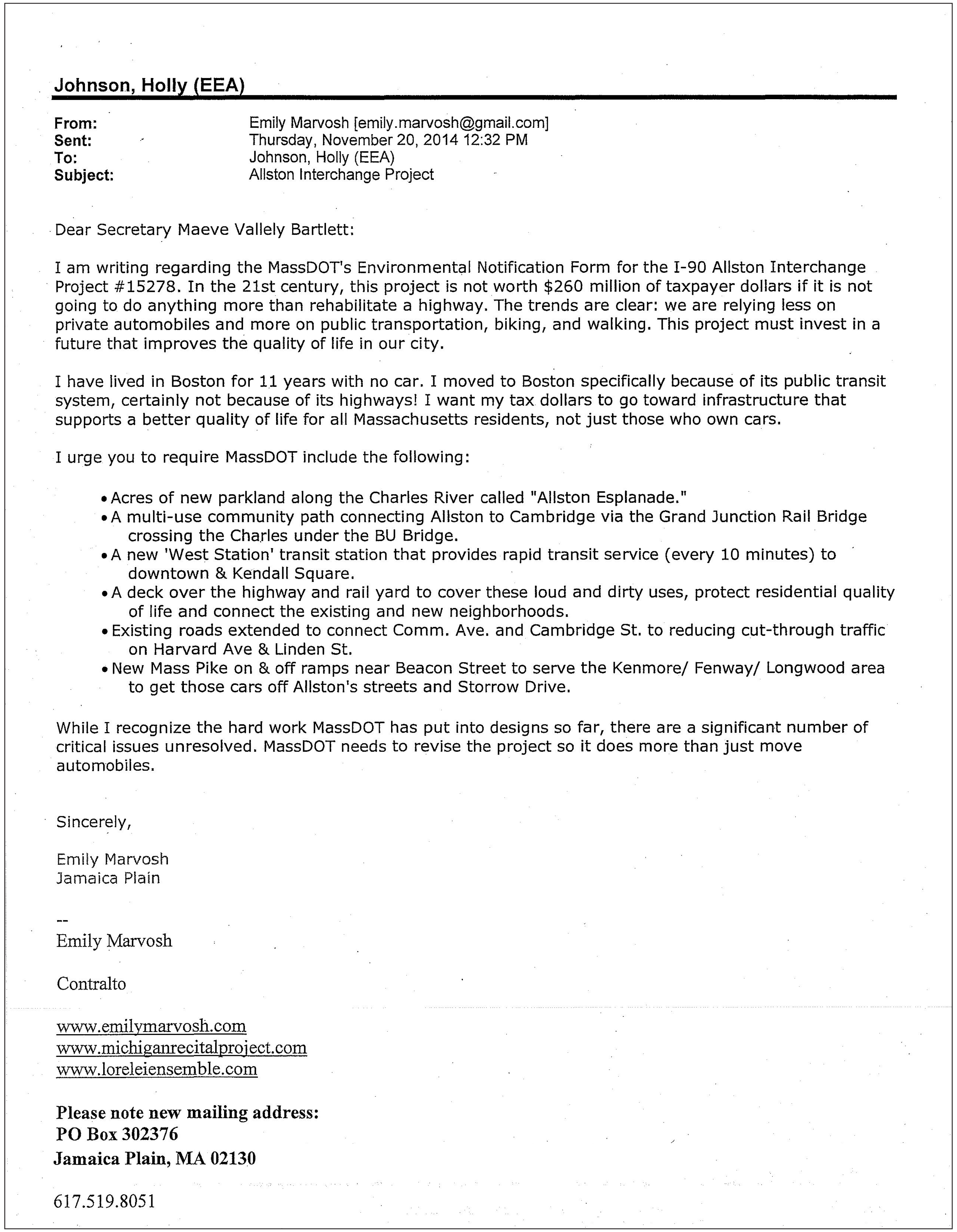
Megan Ramey
457 Mount Auburn Street, Cambridge

--

Megan Ramey Founder, BIKABOUT

megan@bikabout.com | 617-661-5313

bikabout.com



Johnson, Holly (EEA)

From: Emily Marvosh [emily.marvosh@gmail.com]
Sent: Thursday, November 20, 2014 12:32 PM
To: Johnson, Holly (EEA)
Subject: Allston Interchange Project

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I have lived in Boston for 11 years with no car. I moved to Boston specifically because of its public transit system, certainly not because of its highways! I want my tax dollars to go toward infrastructure that supports a better quality of life for all Massachusetts residents, not just those who own cars.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Emily Marvosh
Jamaica Plain

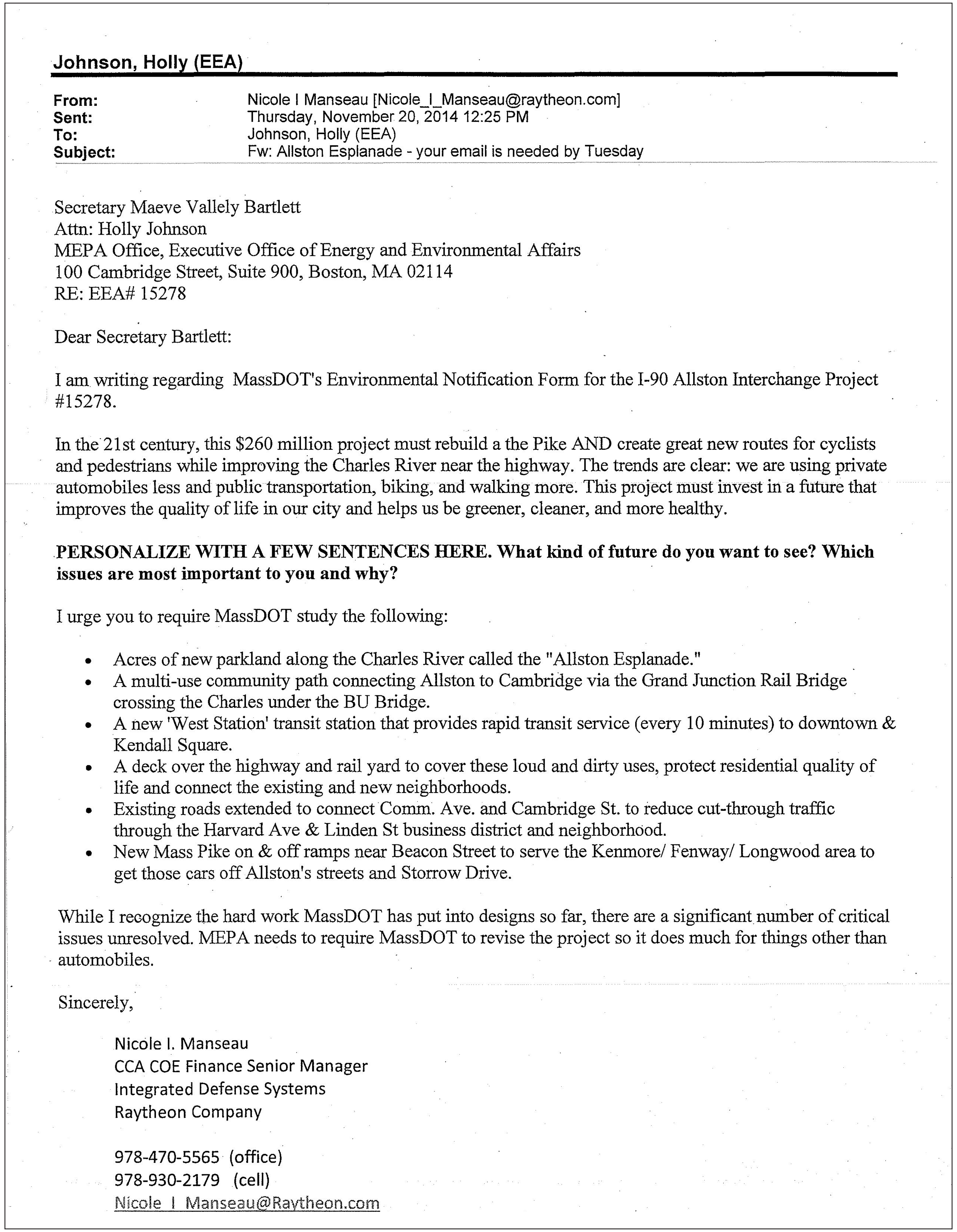
--
Emily Marvosh

Contralto

www.emilymarvosh.com
www.michiganrecitalproject.com
www.loreleiensemble.com

Please note new mailing address:
PO Box 302376
Jamaica Plain, MA 02130

617.519.8051



Johnson, Holly (EEA)

From: Nicole I Manseau [Nicole_I_Manseau@raytheon.com]
Sent: Thursday, November 20, 2014 12:25 PM
To: Johnson, Holly (EEA)
Subject: Fw: Allston Esplanade - your email is needed by Tuesday

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

PERSONALIZE WITH A FEW SENTENCES HERE. What kind of future do you want to see? Which issues are most important to you and why?

I urge you to require MassDOT study the following:

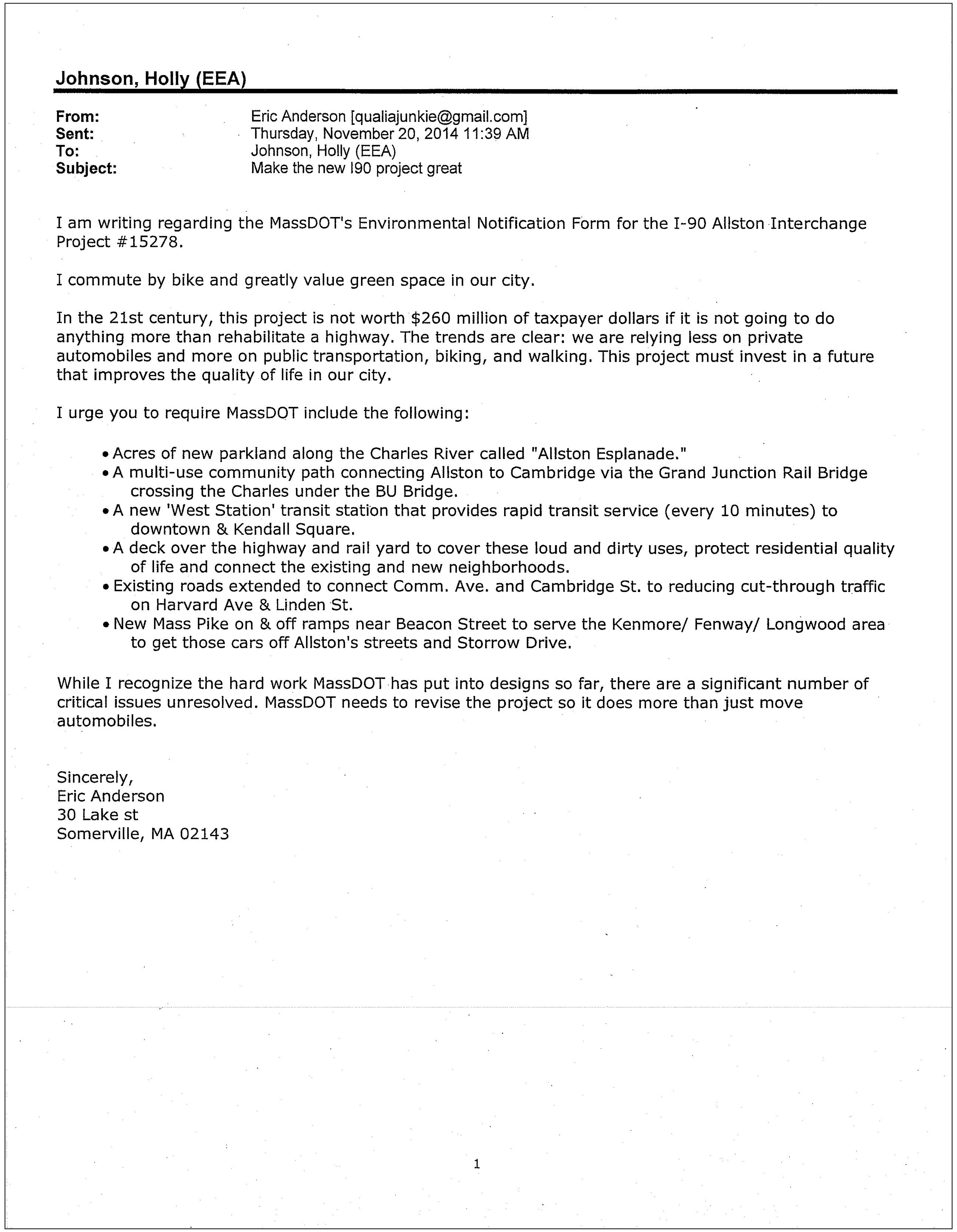
- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,

Nicole I. Manseau
CCA COE Finance Senior Manager
Integrated Defense Systems
Raytheon Company

978-470-5565 (office)
978-930-2179 (cell)
Nicole_I_Manseau@Raytheon.com



Johnson, Holly (EEA)

From:	Eric Anderson [qualiajunkie@gmail.com]
Sent:	Thursday, November 20, 2014 11:39 AM
To:	Johnson, Holly (EEA)
Subject:	Make the new I90 project great

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

I commute by bike and greatly value green space in our city.

In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
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- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,
Eric Anderson
30 Lake st
Somerville, MA 02143

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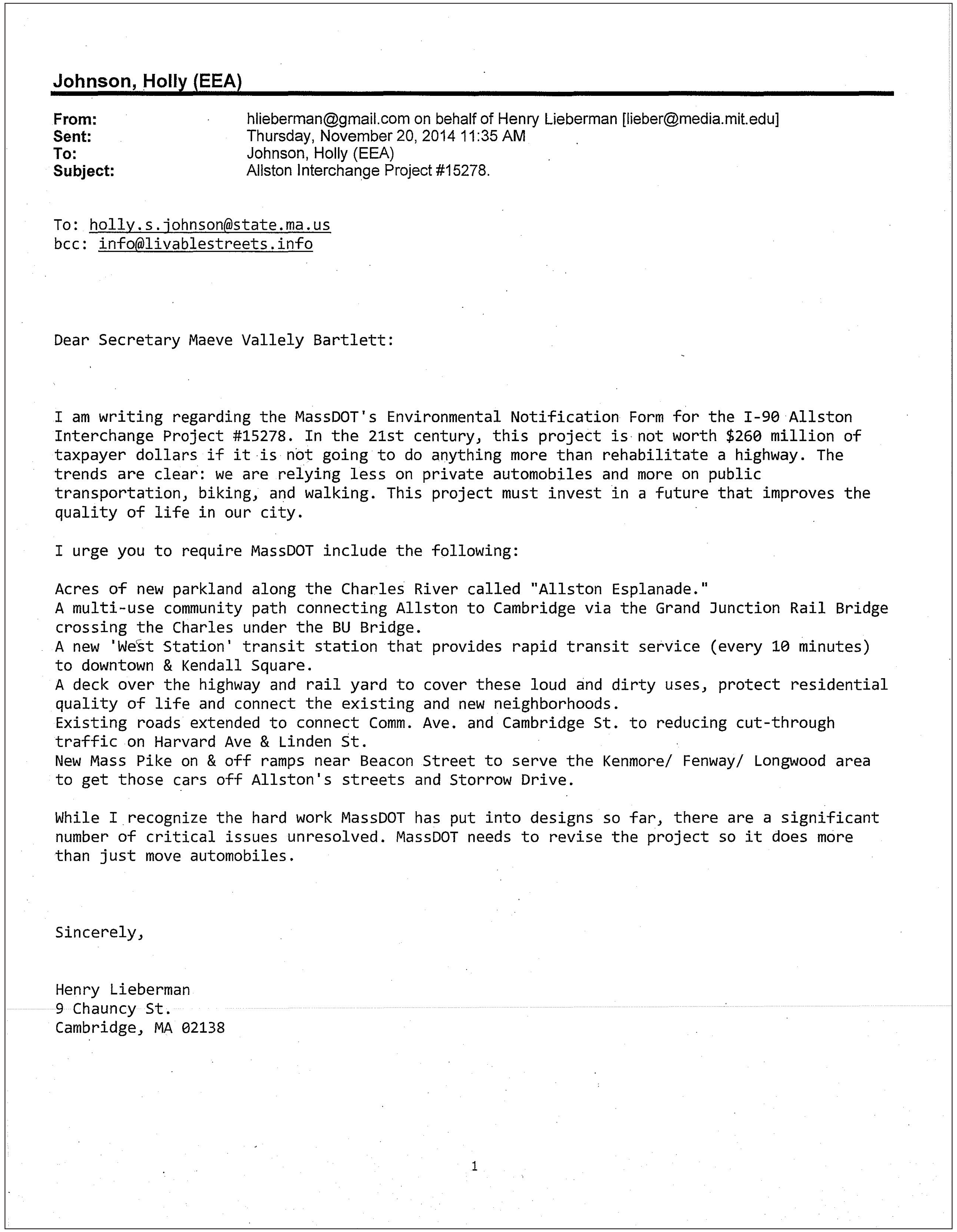

Johnson, Holly (EEA)

From:	hlieberman@gmail.com on behalf of Henry Lieberman [lieber@media.mit.edu]
Sent:	Thursday, November 20, 2014 11:35 AM
To:	Johnson, Holly (EEA)
Subject:	Allston Interchange Project #15278.

To: holly.s.johnson@state.ma.us
bcc: info@livablestreets.info

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:

Acres of new parkland along the Charles River called "Allston Esplanade."
A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
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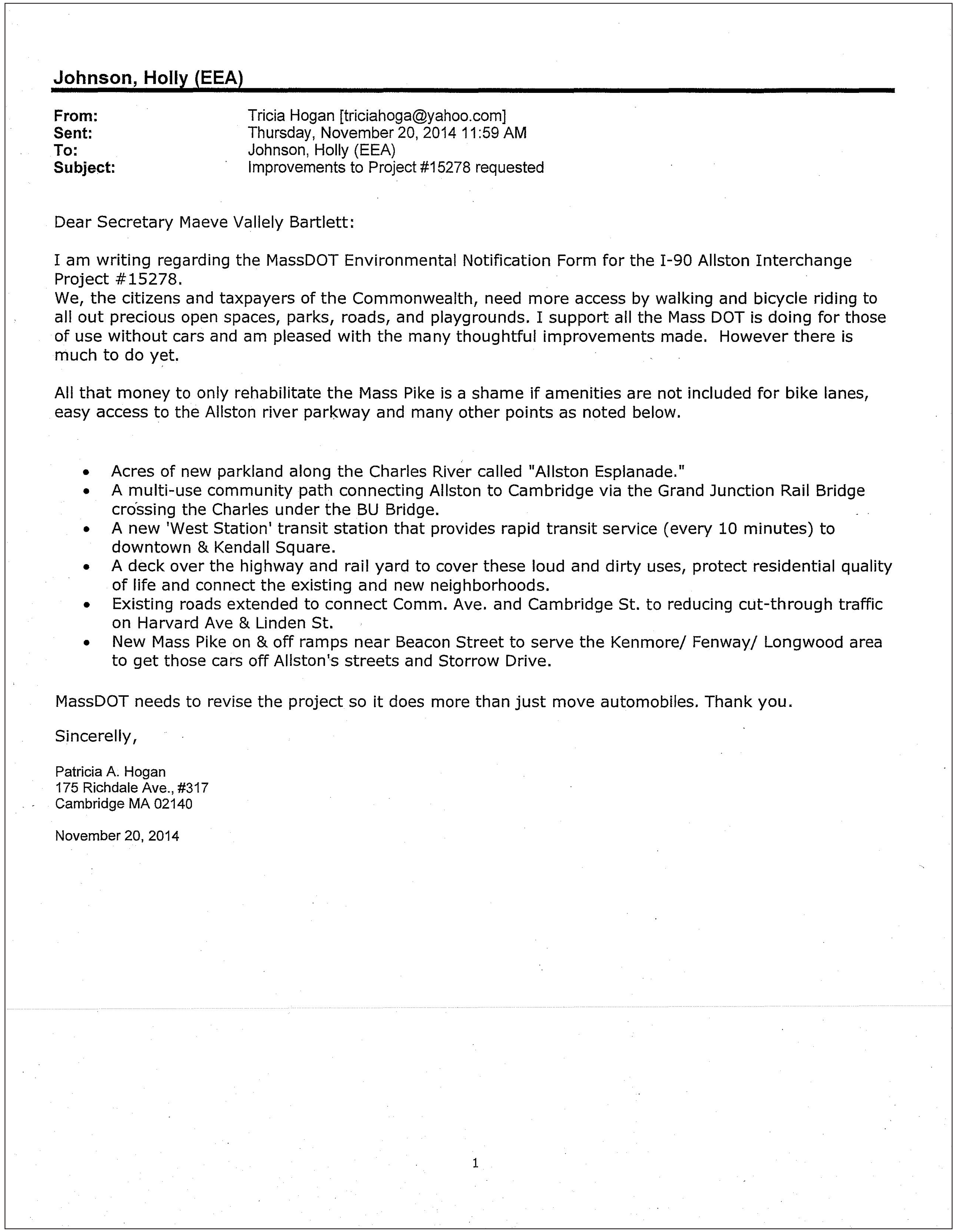
New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Henry Lieberman
9 Chauncy St.
Cambridge, MA 02138

1



Johnson, Holly (EEA)

From: Tricia Hogan [triciahoga@yahoo.com]
Sent: Thursday, November 20, 2014 11:59 AM
To: Johnson, Holly (EEA)
Subject: Improvements to Project #15278 requested

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT Environmental Notification Form for the I-90 Allston Interchange Project #15278.
We, the citizens and taxpayers of the Commonwealth, need more access by walking and bicycle riding to all out precious open spaces, parks, roads, and playgrounds. I support all the Mass DOT is doing for those of use without cars and am pleased with the many thoughtful improvements made. However there is much to do yet.

All that money to only rehabilitate the Mass Pike is a shame if amenities are not included for bike lanes, easy access to the Allston river parkway and many other points as noted below.

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

MassDOT needs to revise the project so it does more than just move automobiles. Thank you.

Sincerelly,

Patricia A. Hogan
175 Richdale Ave., #317
Cambridge MA 02140

November 20, 2014

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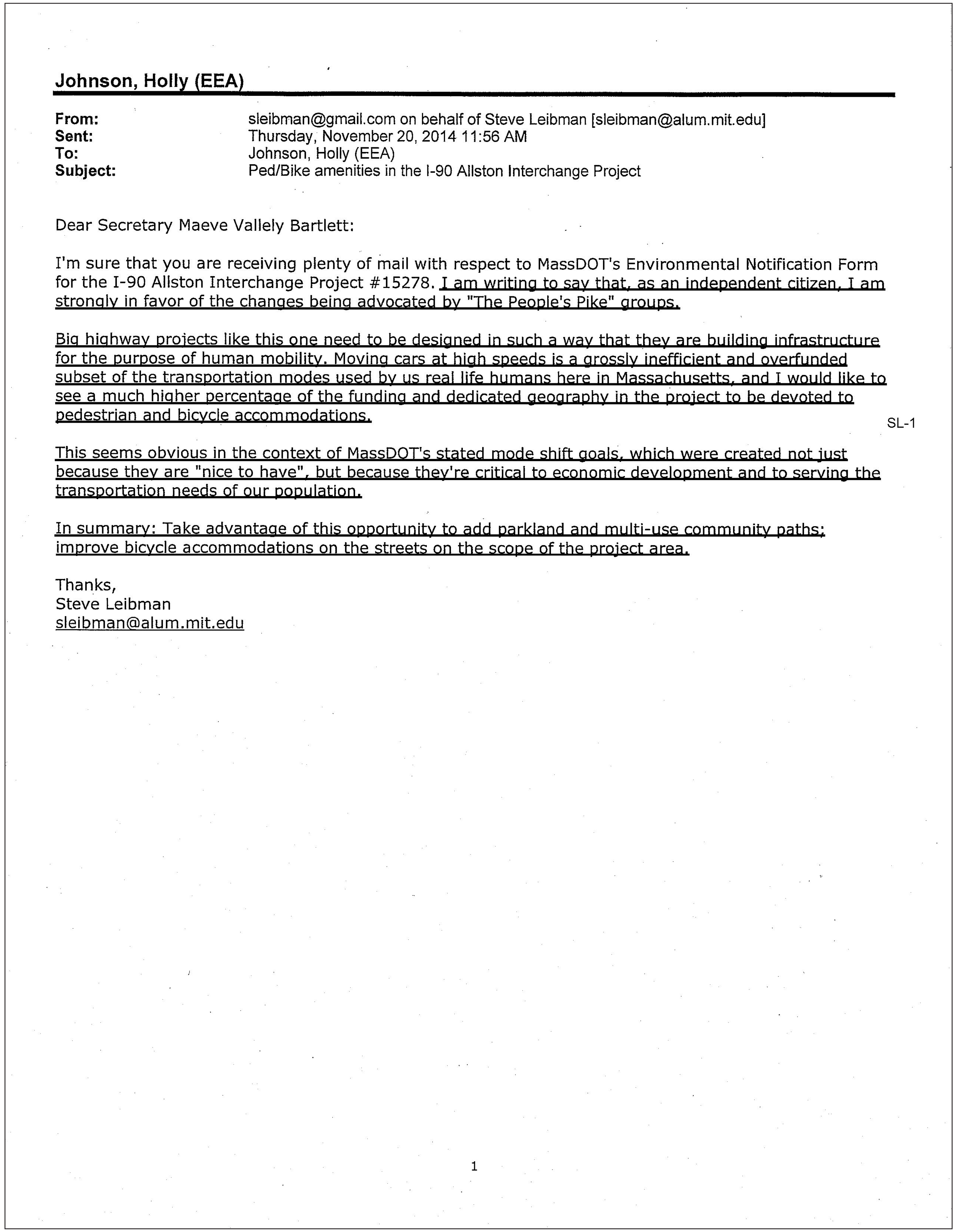

Johnson, Holly (EEA)

From: sleibman@gmail.com on behalf of Steve Leibman [sleibman@alum.mit.edu]
Sent: Thursday, November 20, 2014 11:56 AM
To: Johnson, Holly (EEA)
Subject: Ped/Bike amenities in the I-90 Allston Interchange Project

Dear Secretary Maeve Vallely Bartlett:

I'm sure that you are receiving plenty of mail with respect to MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. I am writing to say that, as an independent citizen, I am strongly in favor of the changes being advocated by "The People's Pike" groups.

Big highway projects like this one need to be designed in such a way that they are building infrastructure for the purpose of human mobility. Moving cars at high speeds is a grossly inefficient and overfunded subset of the transportation modes used by us real life humans here in Massachusetts, and I would like to see a much higher percentage of the funding and dedicated geography in the project to be devoted to pedestrian and bicycle accommodations. SL-1

This seems obvious in the context of MassDOT's stated mode shift goals, which were created not just because they are "nice to have", but because they're critical to economic development and to serving the transportation needs of our population.

In summary: Take advantage of this opportunity to add parkland and multi-use community paths; improve bicycle accommodations on the streets on the scope of the project area.

Thanks,
Steve Leibman
sleibman@alum.mit.edu

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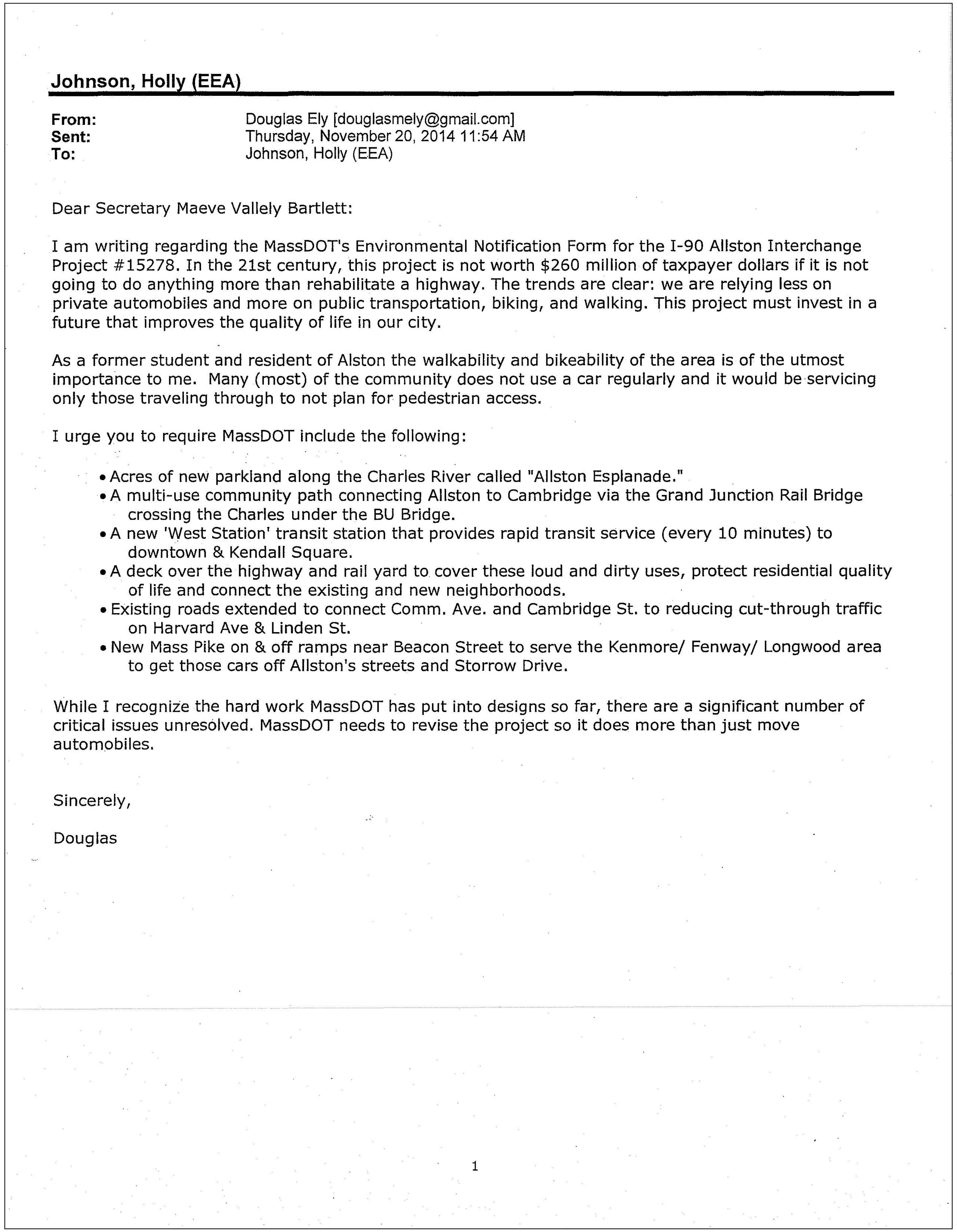

Johnson, Holly (EEA)

From: Douglas Ely [douglasmely@gmail.com]
Sent: Thursday, November 20, 2014 11:54 AM
To: Johnson, Holly (EEA)

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

As a former student and resident of Alston the walkability and bikeability of the area is of the utmost importance to me. Many (most) of the community does not use a car regularly and it would be servicing only those traveling through to not plan for pedestrian access.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Douglas

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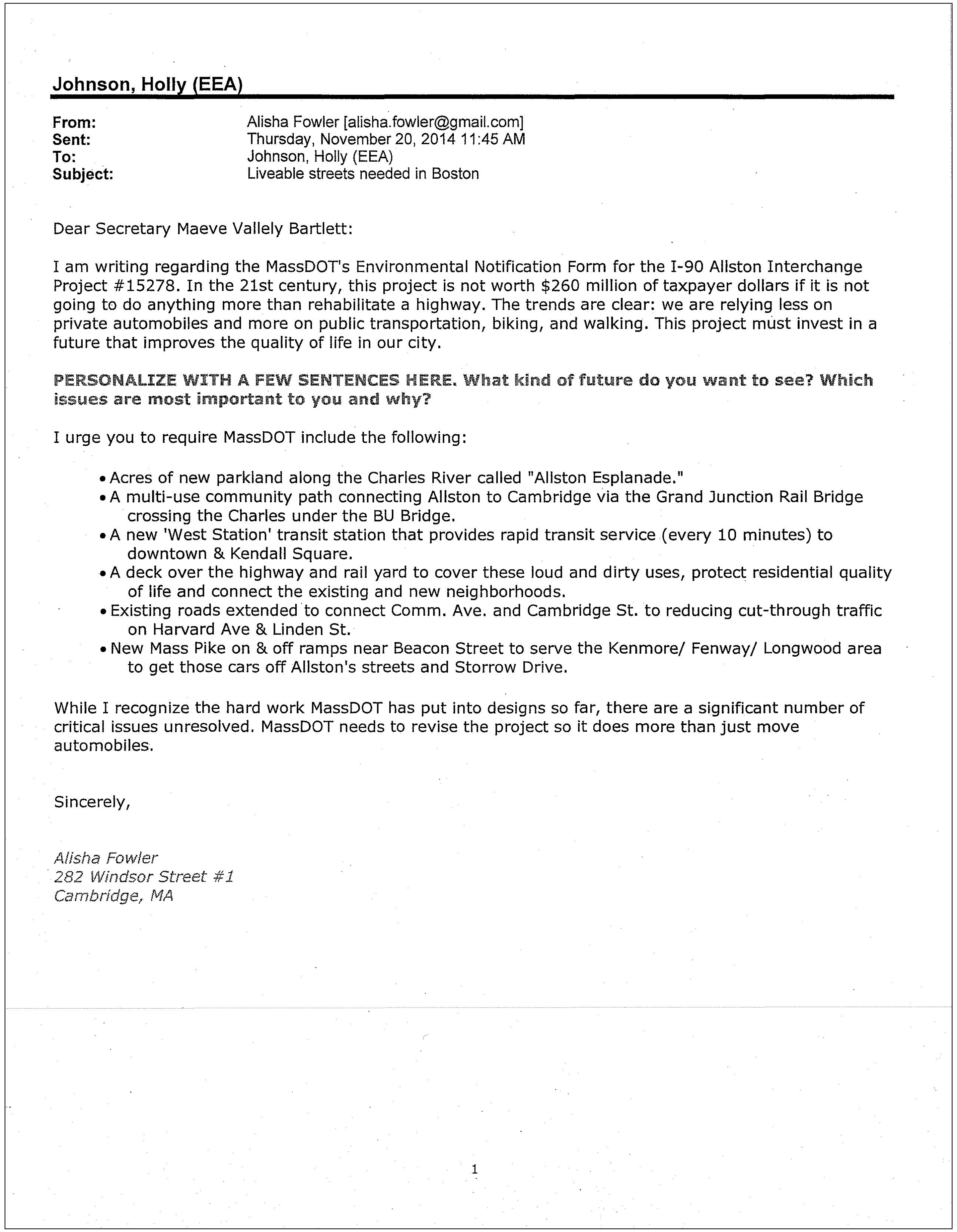

Johnson, Holly (EEA)

From: Alisha Fowler [alisha.fowler@gmail.com]
Sent: Thursday, November 20, 2014 11:45 AM
To: Johnson, Holly (EEA)
Subject: Liveable streets needed in Boston

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

PERSONALIZE WITH A FEW SENTENCES HERE. What kind of future do you want to see? Which issues are most important to you and why?

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
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- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Alisha Fowler
282 Windsor Street #1
Cambridge, MA

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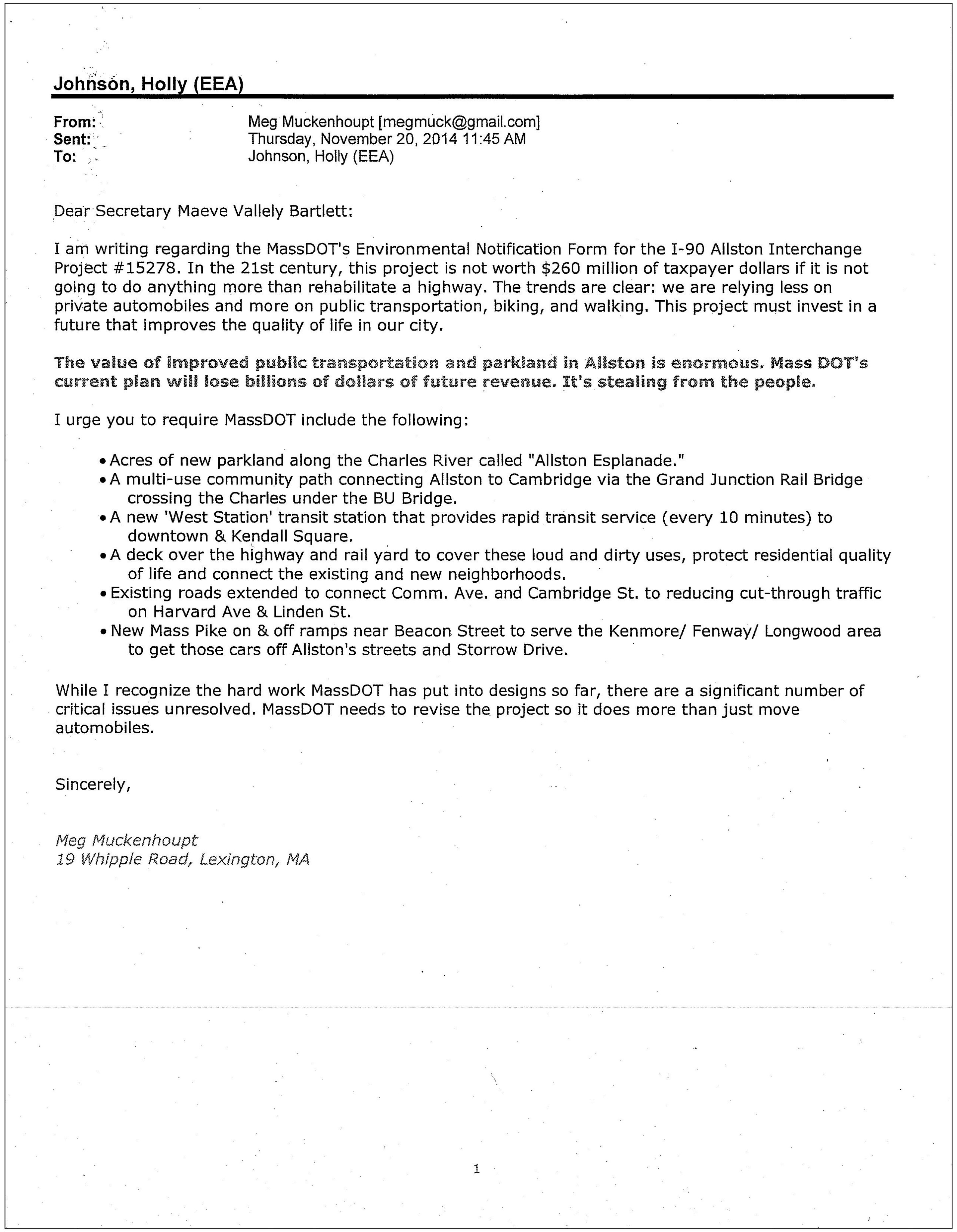


Johnson, Holly (EEA)

From: Meg Muckenhoupt [megmuck@gmail.com]
Sent: Thursday, November 20, 2014 11:45 AM
To: Johnson, Holly (EEA)

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

The value of improved public transportation and parkland in Allston is enormous. Mass DOT's current plan will lose billions of dollars of future revenue. It's stealing from the people.

I urge you to require MassDOT include the following:

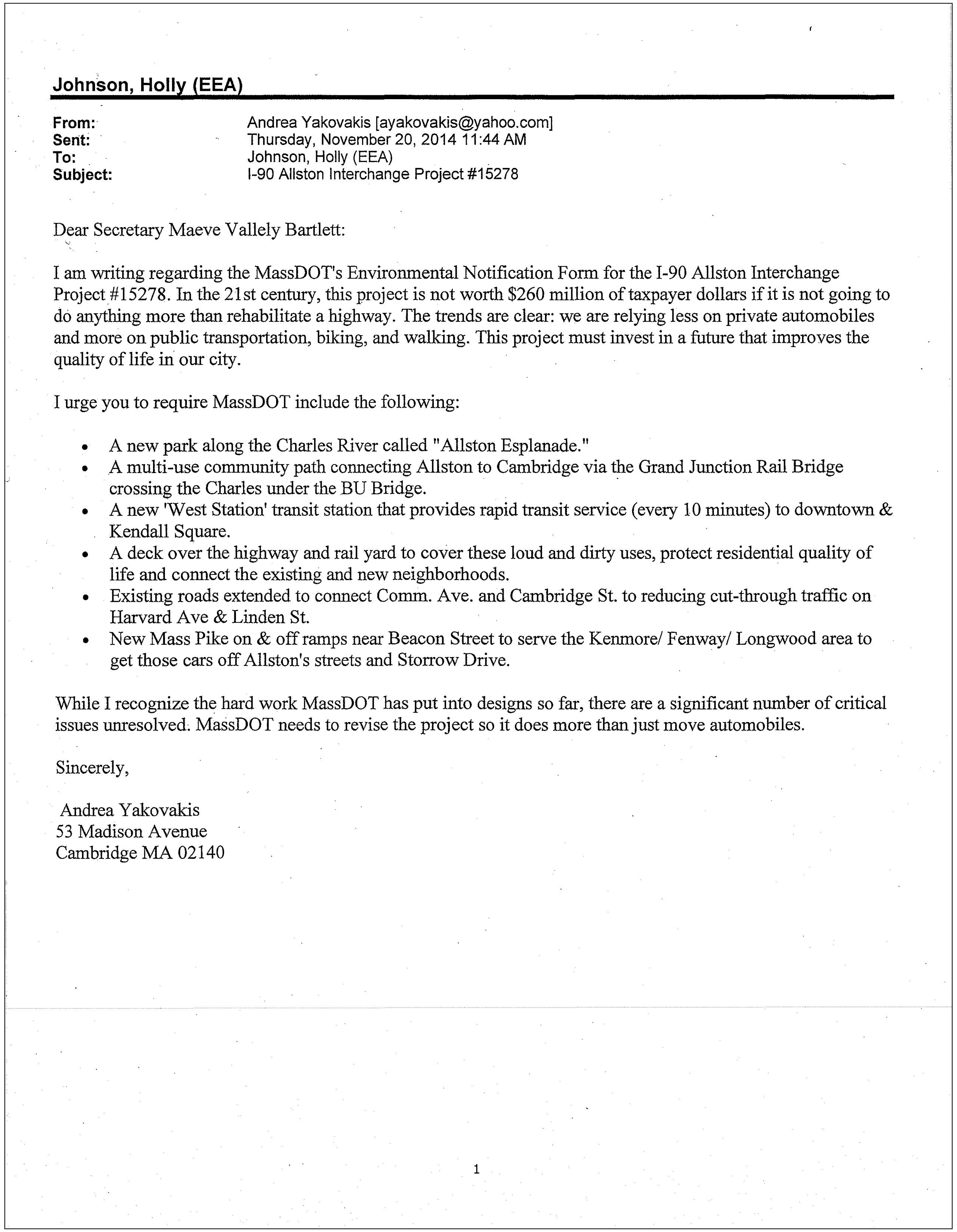
- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Meg Muckenhoupt
19 Whipple Road, Lexington, MA

1



Johnson, Holly (EEA)

From: Andrea Yakovakis [ayakovakis@yahoo.com]
Sent: Thursday, November 20, 2014 11:44 AM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:

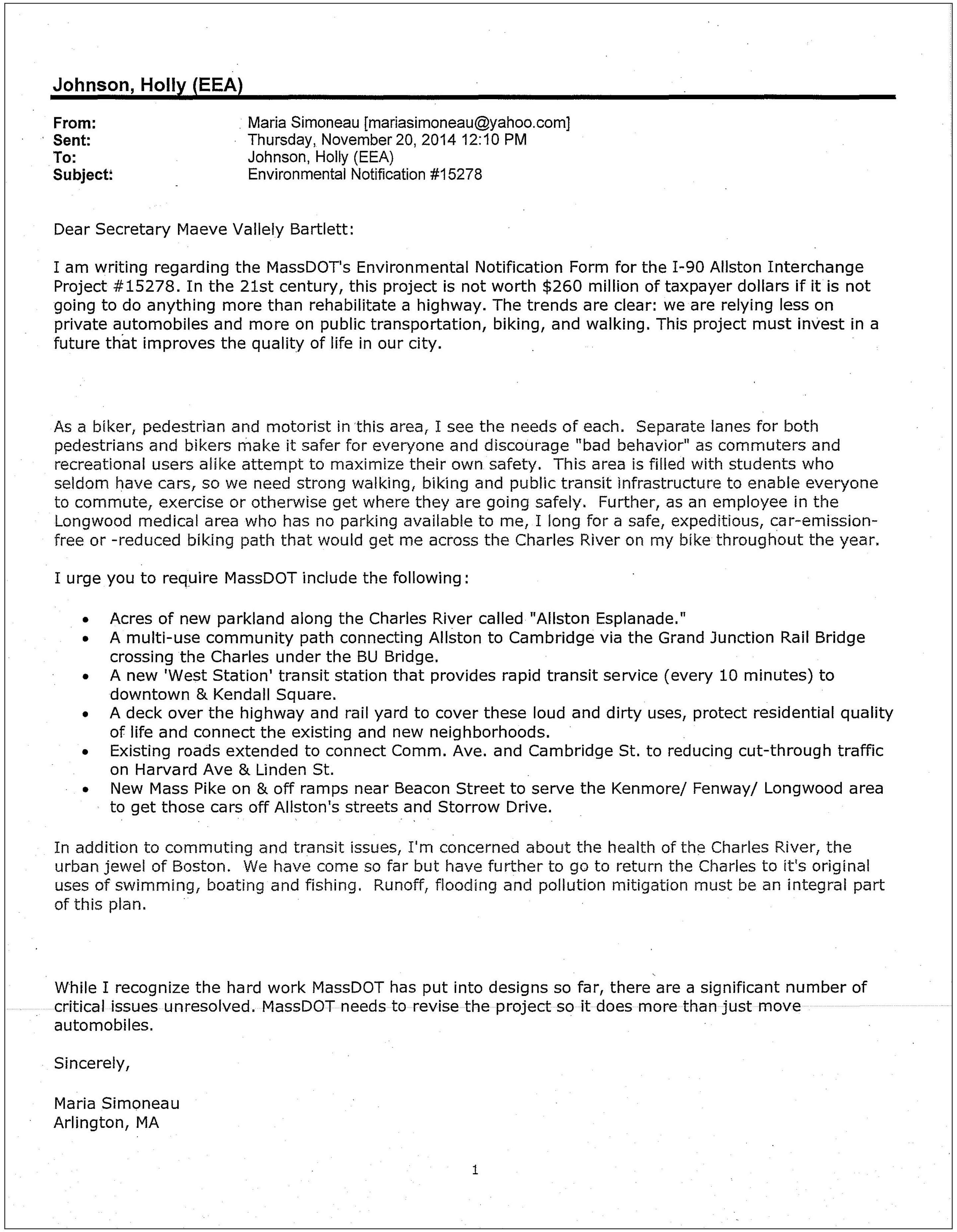
- A new park along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Andrea Yakovakis
53 Madison Avenue
Cambridge MA 02140

1



Johnson, Holly (EEA)

From: Maria Simoneau [mariasimoneau@yahoo.com]
Sent: Thursday, November 20, 2014 12:10 PM
To: Johnson, Holly (EEA)
Subject: Environmental Notification #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

As a biker, pedestrian and motorist in this area, I see the needs of each. Separate lanes for both pedestrians and bikers make it safer for everyone and discourage "bad behavior" as commuters and recreational users alike attempt to maximize their own safety. This area is filled with students who seldom have cars, so we need strong walking, biking and public transit infrastructure to enable everyone to commute, exercise or otherwise get where they are going safely. Further, as an employee in the Longwood medical area who has no parking available to me, I long for a safe, expeditious, car-emission-free or -reduced biking path that would get me across the Charles River on my bike throughout the year.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

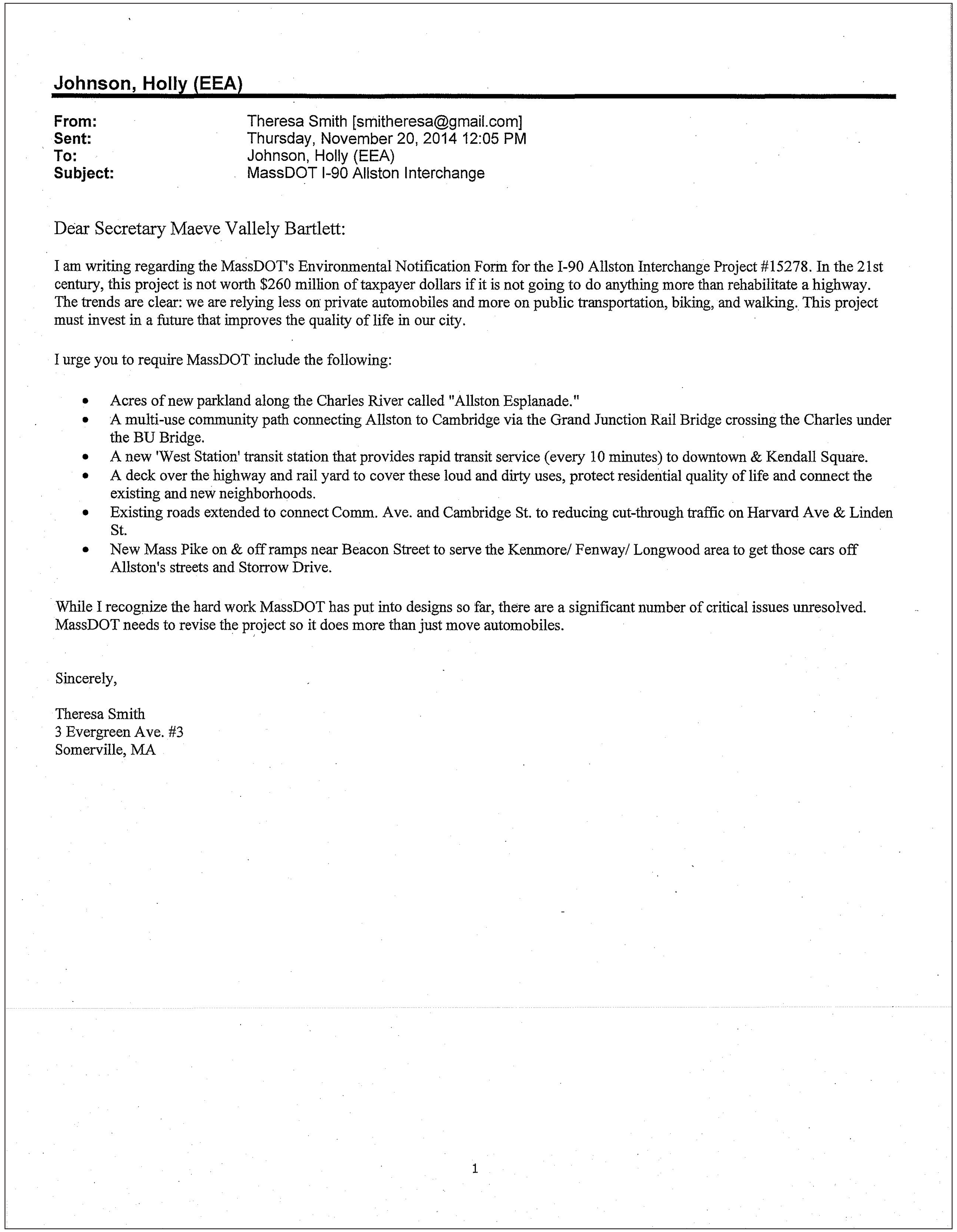
In addition to commuting and transit issues, I'm concerned about the health of the Charles River, the urban jewel of Boston. We have come so far but have further to go to return the Charles to it's original uses of swimming, boating and fishing. Runoff, flooding and pollution mitigation must be an integral part of this plan.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Maria Simoneau
Arlington, MA

1



Johnson, Holly (EEA)

From: Theresa Smith [smitheresa@gmail.com]
Sent: Thursday, November 20, 2014 12:05 PM
To: Johnson, Holly (EEA)
Subject: MassDOT I-90 Allston Interchange

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
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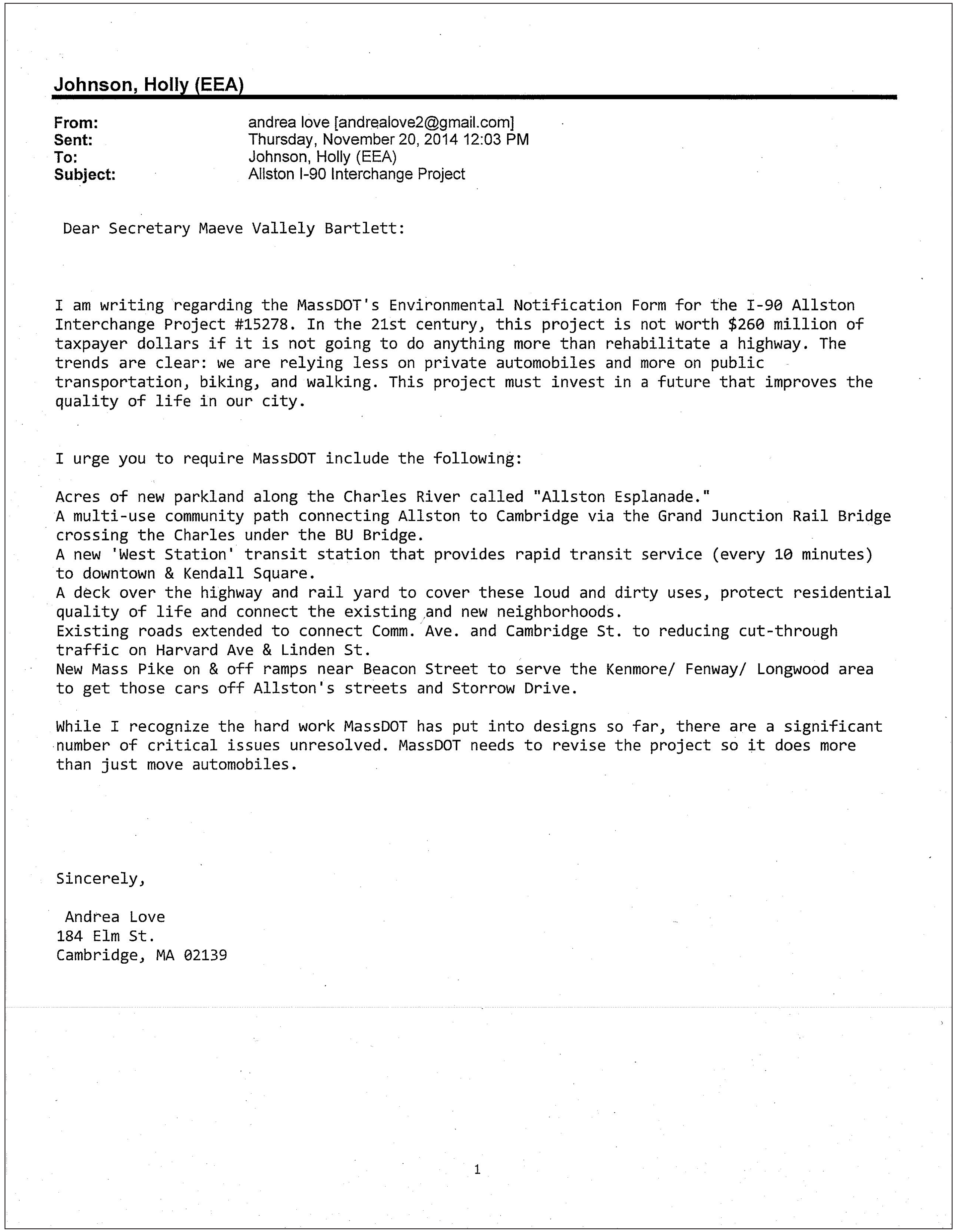
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Theresa Smith
3 Evergreen Ave. #3
Somerville, MA

1



Johnson, Holly (EEA)

From: andrea love [andrealove2@gmail.com]
Sent: Thursday, November 20, 2014 12:03 PM
To: Johnson, Holly (EEA)
Subject: Allston I-90 Interchange Project

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:

Acres of new parkland along the Charles River called "Allston Esplanade."
A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
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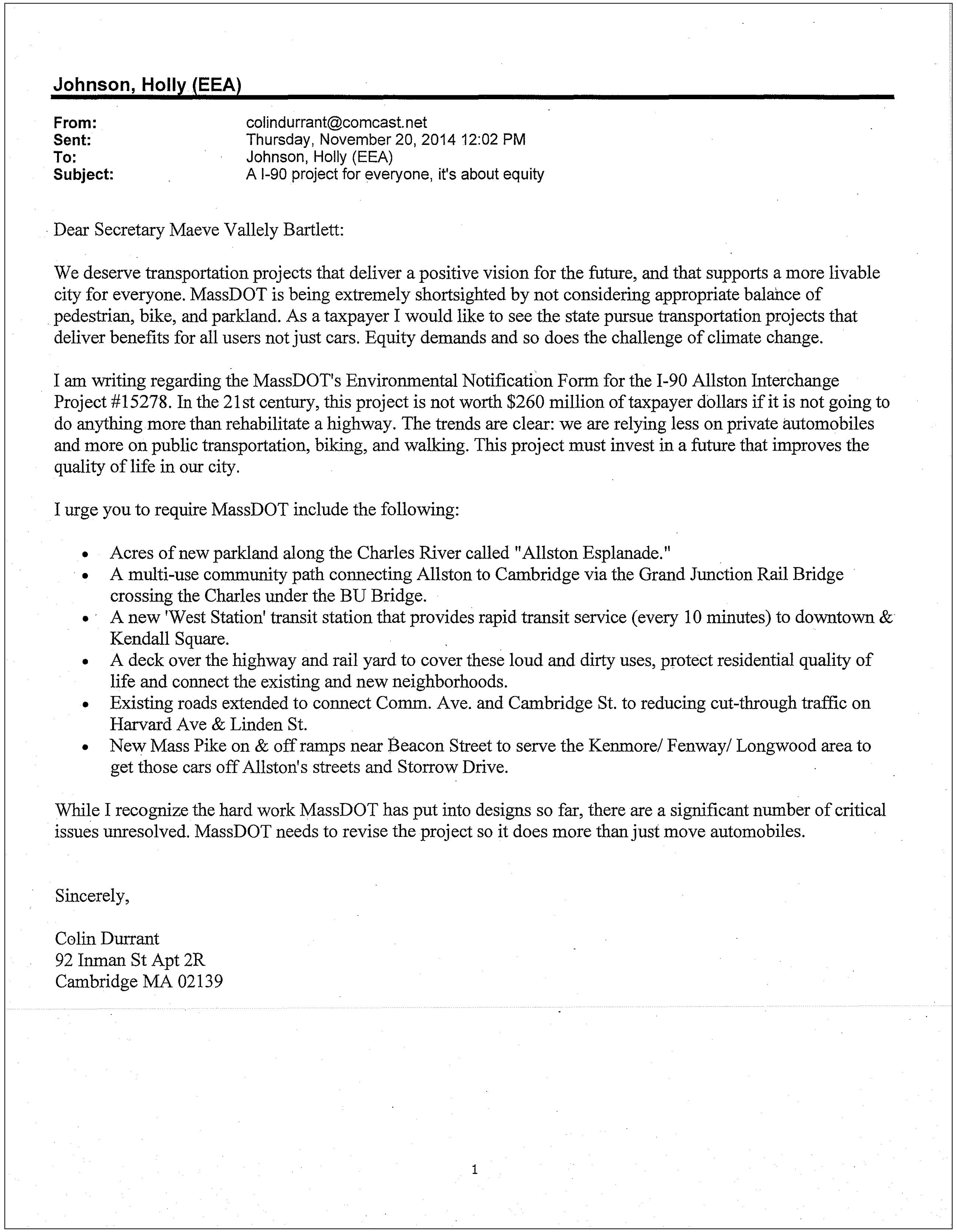
New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Andrea Love
184 Elm St.
Cambridge, MA 02139

1



Johnson, Holly (EEA)

From: colindurrant@comcast.net
Sent: Thursday, November 20, 2014 12:02 PM
To: Johnson, Holly (EEA)
Subject: A I-90 project for everyone, it's about equity

Dear Secretary Maeve Vallely Bartlett:

We deserve transportation projects that deliver a positive vision for the future, and that supports a more livable city for everyone. MassDOT is being extremely shortsighted by not considering appropriate balance of pedestrian, bike, and parkland. As a taxpayer I would like to see the state pursue transportation projects that deliver benefits for all users not just cars. Equity demands and so does the challenge of climate change.

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
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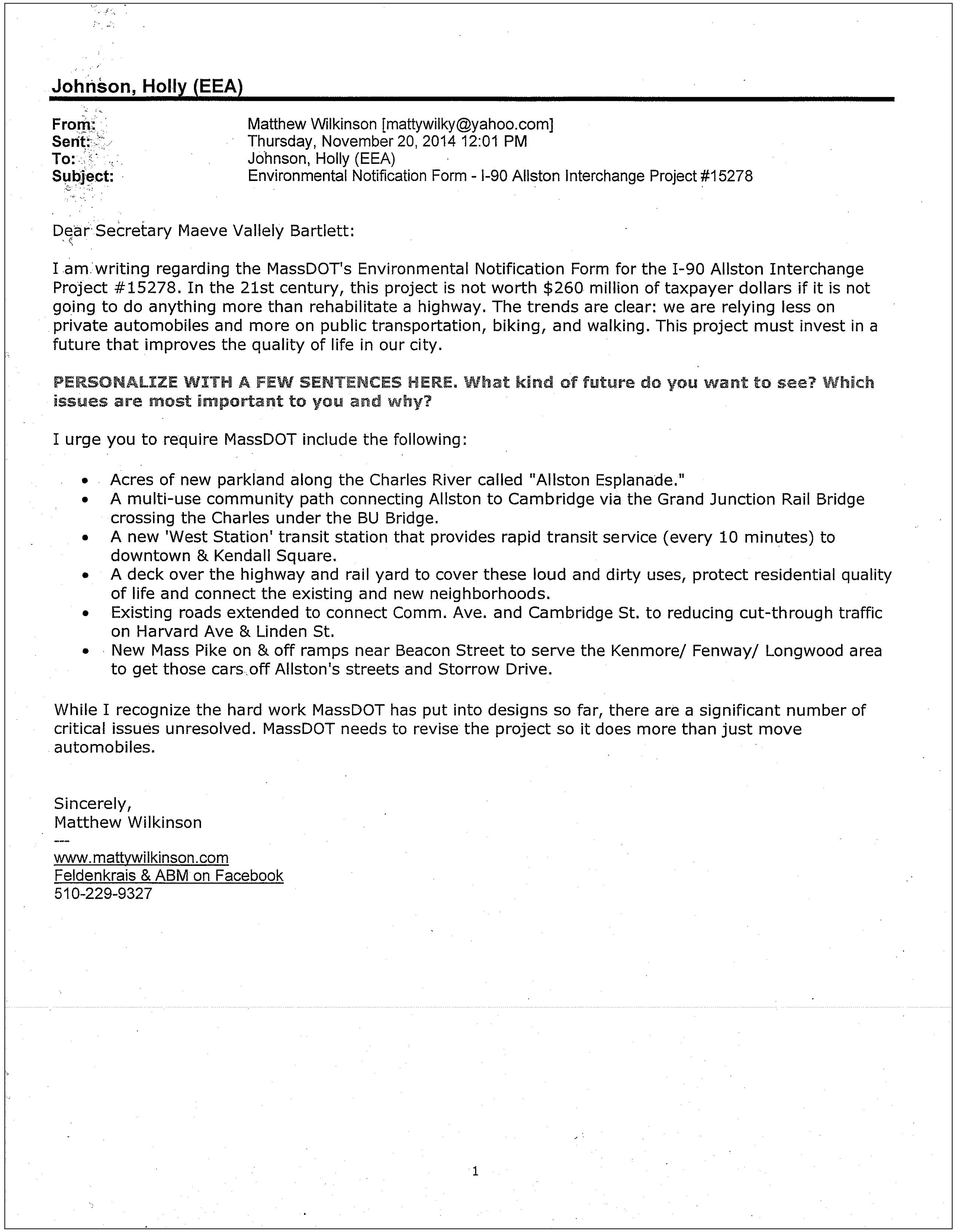
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Colin Durrant
92 Inman St Apt 2R
Cambridge MA 02139

1



Johnson, Holly (EEA)

From: Matthew Wilkinson [mattywilky@yahoo.com]
Sent: Thursday, November 20, 2014 12:01 PM
To: Johnson, Holly (EEA)
Subject: Environmental Notification Form - I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

PERSONALIZE WITH A FEW SENTENCES HERE. What kind of future do you want to see? Which issues are most important to you and why?

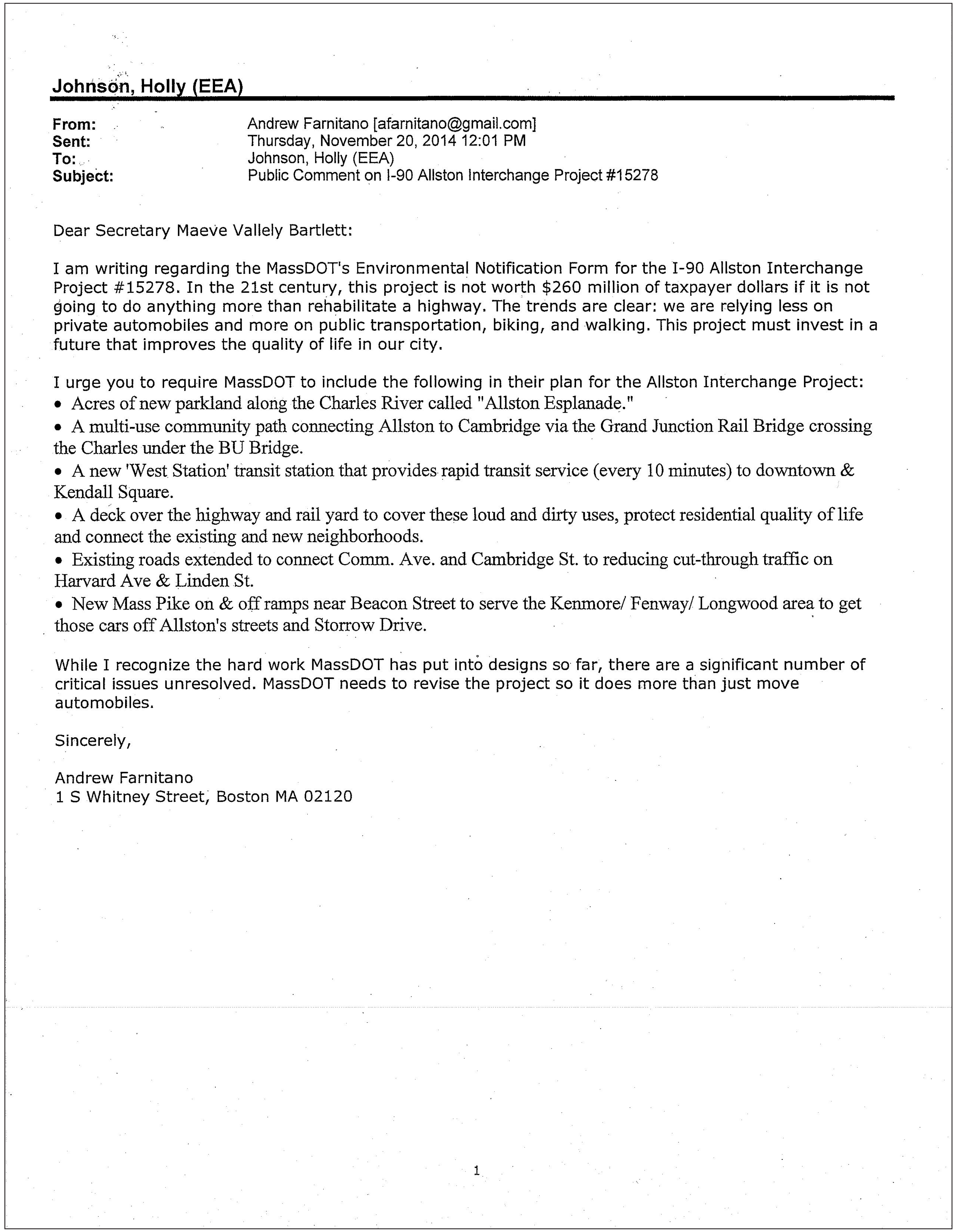
I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,
Matthew Wilkinson
---
www.mattywilkinson.com
Feldenkrais & ABM on Facebook
510-229-9327

1



Johnson, Holly (EEA)

From: Andrew Farnitano [afarnitano@gmail.com]
Sent: Thursday, November 20, 2014 12:01 PM
To: Johnson, Holly (EEA)
Subject: Public Comment on I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

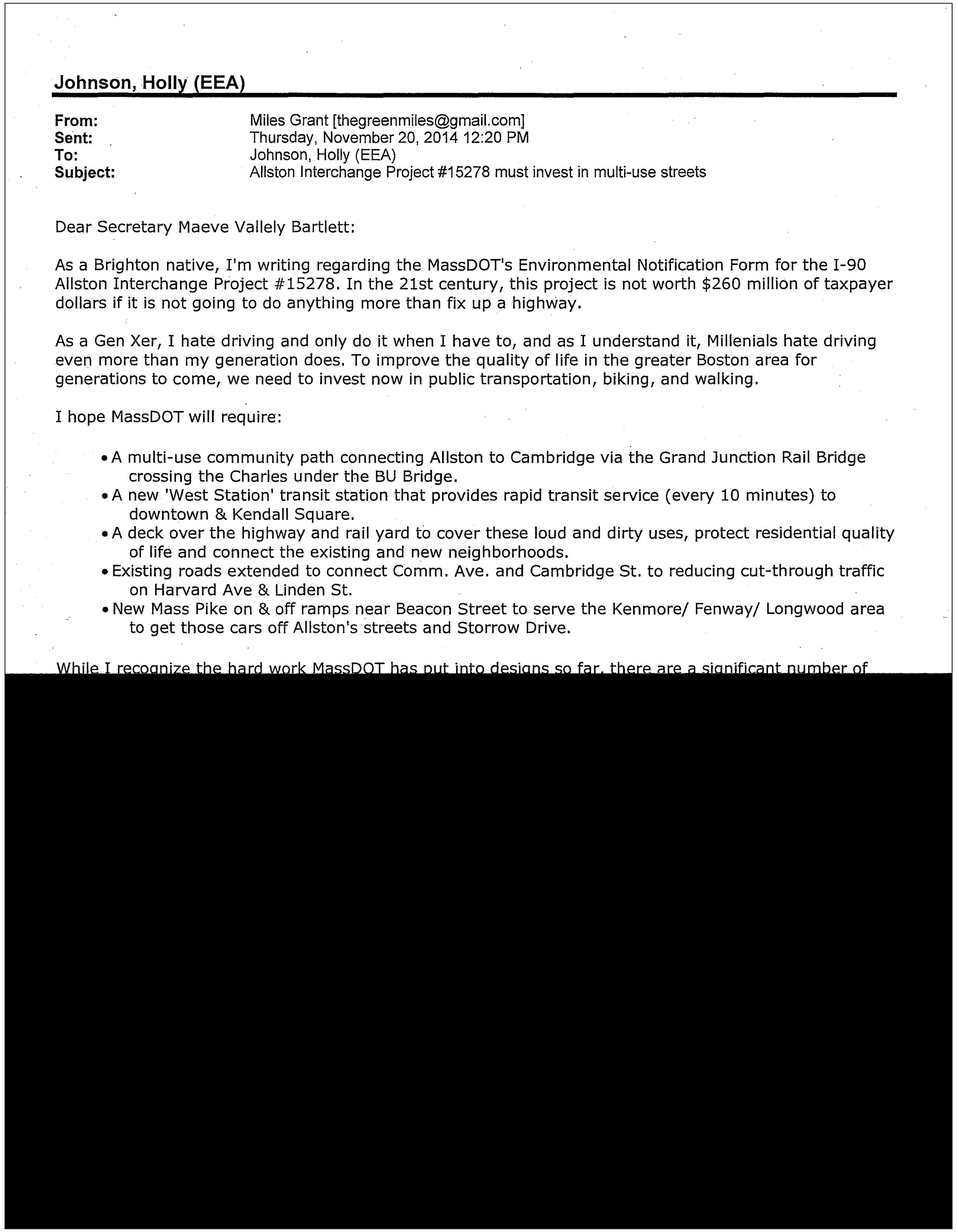
I urge you to require MassDOT to include the following in their plan for the Allston Interchange Project:
- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Andrew Farnitano
1 S Whitney Street, Boston MA 02120

1



Johnson, Holly (EEA)

From: Miles Grant [thegreenmiles@gmail.com]
Sent: Thursday, November 20, 2014 12:20 PM
To: Johnson, Holly (EEA)
Subject: Allston Interchange Project #15278 must invest in multi-use streets

Dear Secretary Maeve Vallely Bartlett:

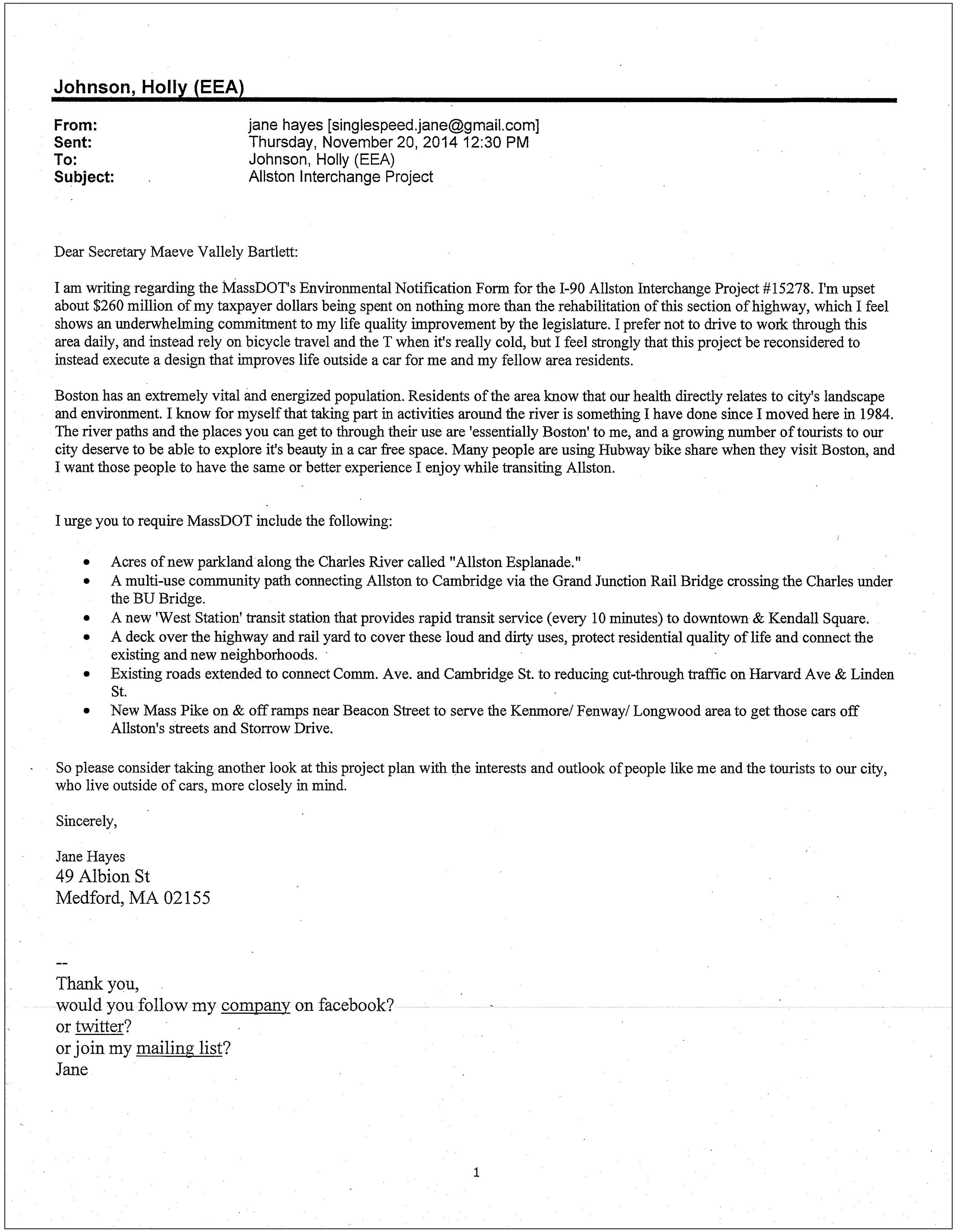
As a Brighton native, I'm writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than fix up a highway.

As a Gen Xer, I hate driving and only do it when I have to, and as I understand it, Millenials hate driving even more than my generation does. To improve the quality of life in the greater Boston area for generations to come, we need to invest now in public transportation, biking, and walking.

I hope MassDOT will require:

- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

[redacted]



Johnson, Holly (EEA)

From: jane hayes [singlespeed.jane@gmail.com]
Sent: Thursday, November 20, 2014 12:30 PM
To: Johnson, Holly (EEA)
Subject: Allston Interchange Project

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. I'm upset about $260 million of my taxpayer dollars being spent on nothing more than the rehabilitation of this section of highway, which I feel shows an underwhelming commitment to my life quality improvement by the legislature. I prefer not to drive to work through this area daily, and instead rely on bicycle travel and the T when it's really cold, but I feel strongly that this project be reconsidered to instead execute a design that improves life outside a car for me and my fellow area residents.

Boston has an extremely vital and energized population. Residents of the area know that our health directly relates to city's landscape and environment. I know for myself that taking part in activities around the river is something I have done since I moved here in 1984. The river paths and the places you can get to through their use are 'essentially Boston' to me, and a growing number of tourists to our city deserve to be able to explore it's beauty in a car free space. Many people are using Hubway bike share when they visit Boston, and I want those people to have the same or better experience I enjoy while transiting Allston.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

So please consider taking another look at this project plan with the interests and outlook of people like me and the tourists to our city, who live outside of cars, more closely in mind.

Sincerely,

Jane Hayes
49 Albion St
Medford, MA 02155

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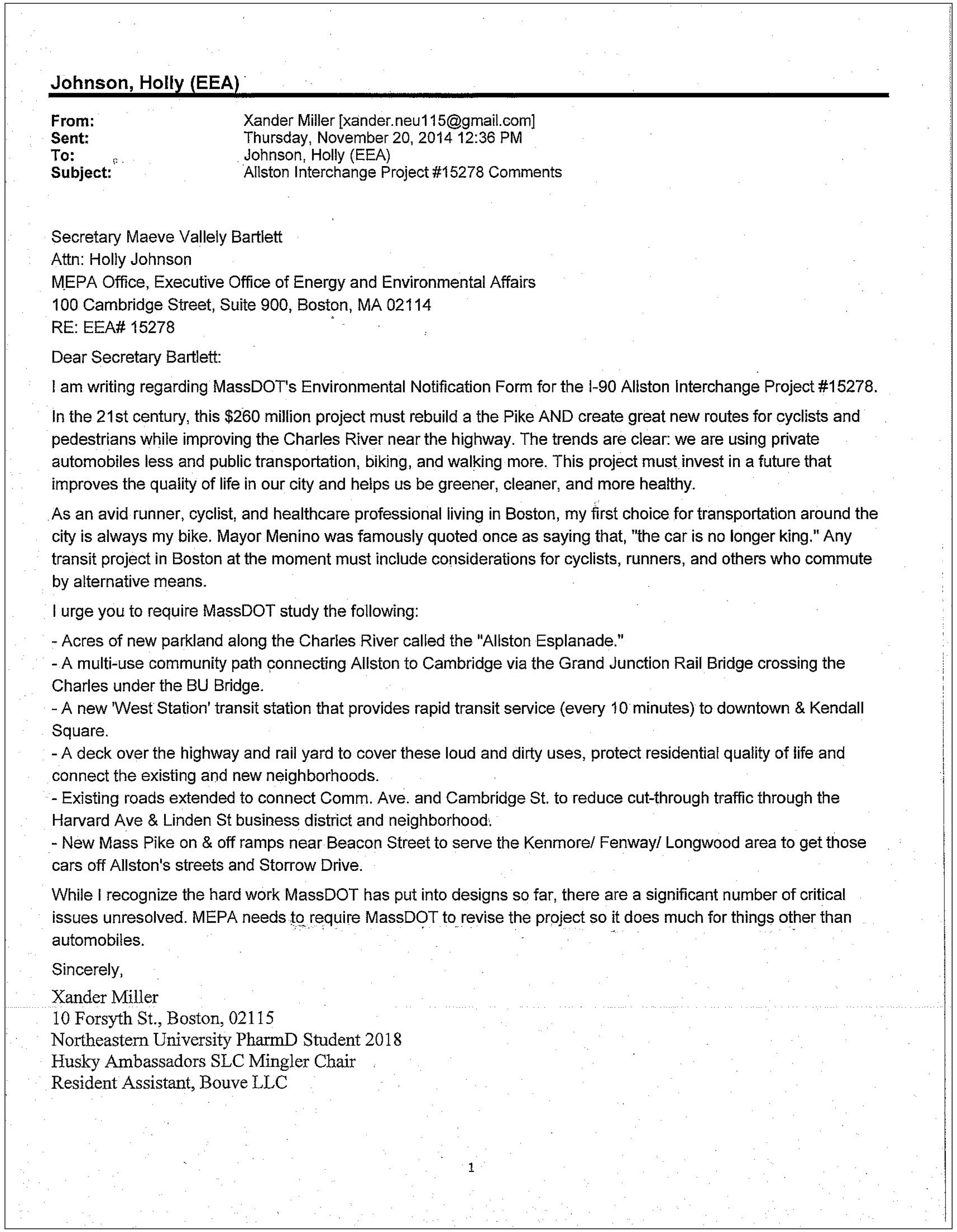
Thank you,
would you follow my company on facebook?
or twitter?
or join my mailing list?
Jane



Johnson, Holly (EEA)

From: Xander Miller [xander.neu115@gmail.com]
Sent: Thursday, November 20, 2014 12:36 PM
To: Johnson, Holly (EEA)
Subject: Allston Interchange Project #15278 Comments

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

As an avid runner, cyclist, and healthcare professional living in Boston, my first choice for transportation around the city is always my bike. Mayor Menino was famously quoted once as saying that, "the car is no longer king." Any transit project in Boston at the moment must include considerations for cyclists, runners, and others who commute by alternative means.

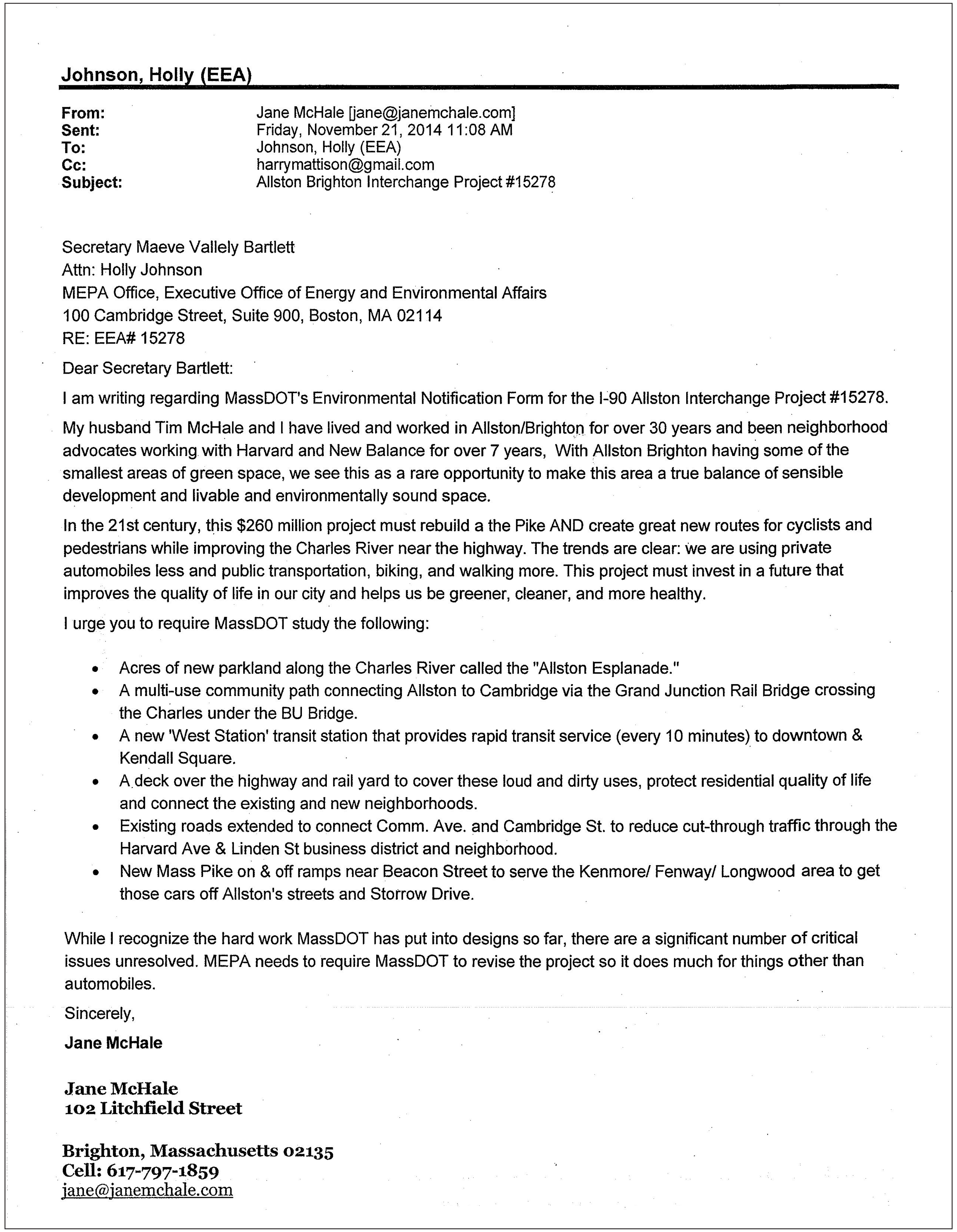
I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,

Xander Miller
10 Forsyth St., Boston, 02115
Northeastern University PharmD Student 2018
Husky Ambassadors SLC Mingler Chair
Resident Assistant, Bouve LLC



Johnson, Holly (EEA)

From: Jane McHale [jane@janemchale.com]
Sent: Friday, November 21, 2014 11:08 AM
To: Johnson, Holly (EEA)
Cc: harrymattison@gmail.com
Subject: Allston Brighton Interchange Project #15278

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

My husband Tim McHale and I have lived and worked in Allston/Brighton for over 30 years and been neighborhood advocates working with Harvard and New Balance for over 7 years, With Allston Brighton having some of the smallest areas of green space, we see this as a rare opportunity to make this area a true balance of sensible development and livable and environmentally sound space.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
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- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

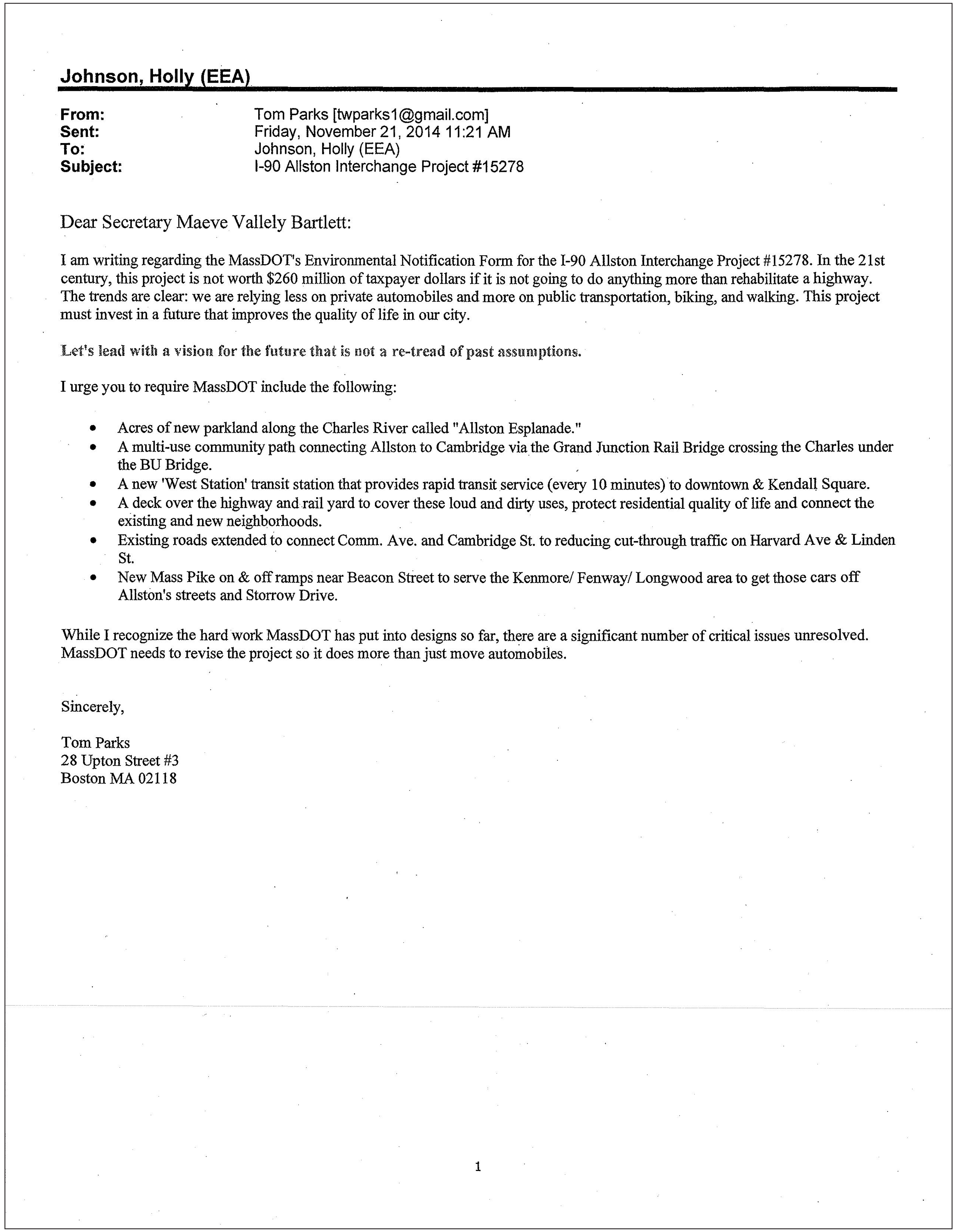
While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,

Jane McHale

Jane McHale
102 Litchfield Street

Brighton, Massachusetts 02135
Cell: 617-797-1859
jane@janemchale.com



Johnson, Holly (EEA)

From: Tom Parks [twparks1@gmail.com]
Sent: Friday, November 21, 2014 11:21 AM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

Let's lead with a vision for the future that is not a re-tread of past assumptions.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
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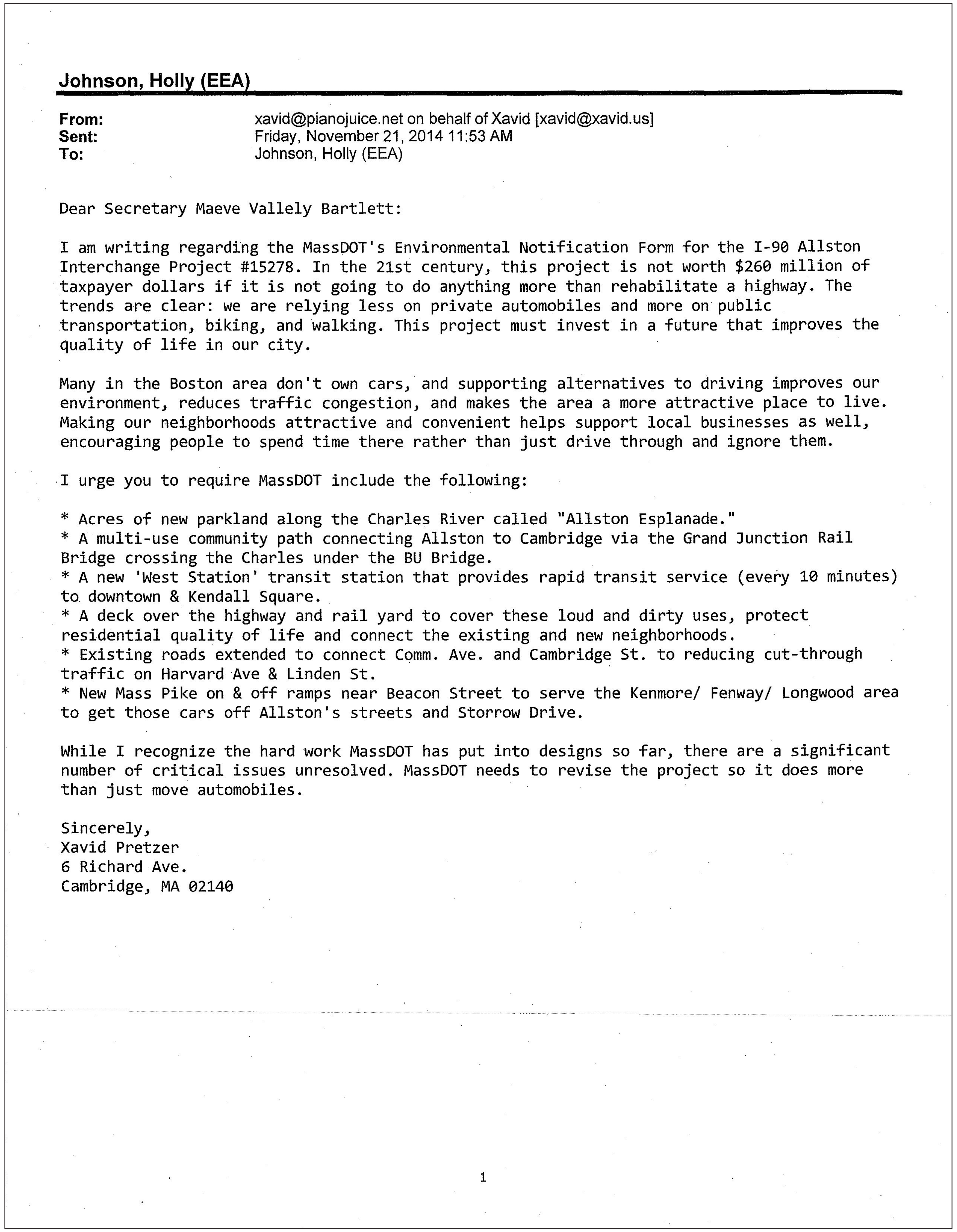
While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Tom Parks
28 Upton Street #3
Boston MA 02118

1



Johnson, Holly (EEA)

From: xavid@pianojuice.net on behalf of Xavid [xavid@xavid.us]
Sent: Friday, November 21, 2014 11:53 AM
To: Johnson, Holly (EEA)

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

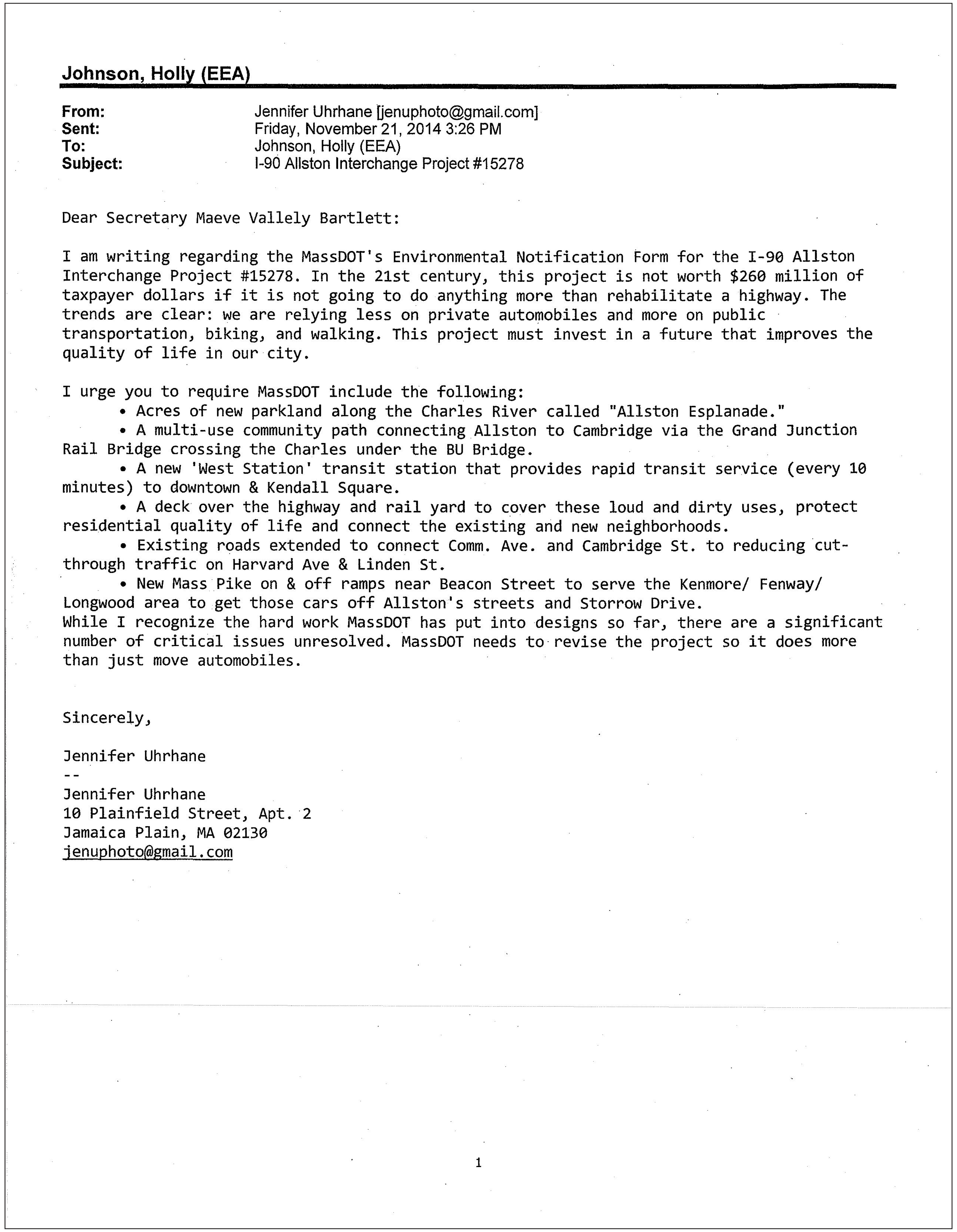
Many in the Boston area don't own cars, and supporting alternatives to driving improves our environment, reduces traffic congestion, and makes the area a more attractive place to live. Making our neighborhoods attractive and convenient helps support local businesses as well, encouraging people to spend time there rather than just drive through and ignore them.

I urge you to require MassDOT include the following:

* Acres of new parkland along the Charles River called "Allston Esplanade."
* A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
* A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
* A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
* Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
* New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,
Xavid Pretzer
6 Richard Ave.
Cambridge, MA 02140



Johnson, Holly (EEA)

From: Jennifer Uhrhane [jenuphoto@gmail.com]
Sent: Friday, November 21, 2014 3:26 PM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
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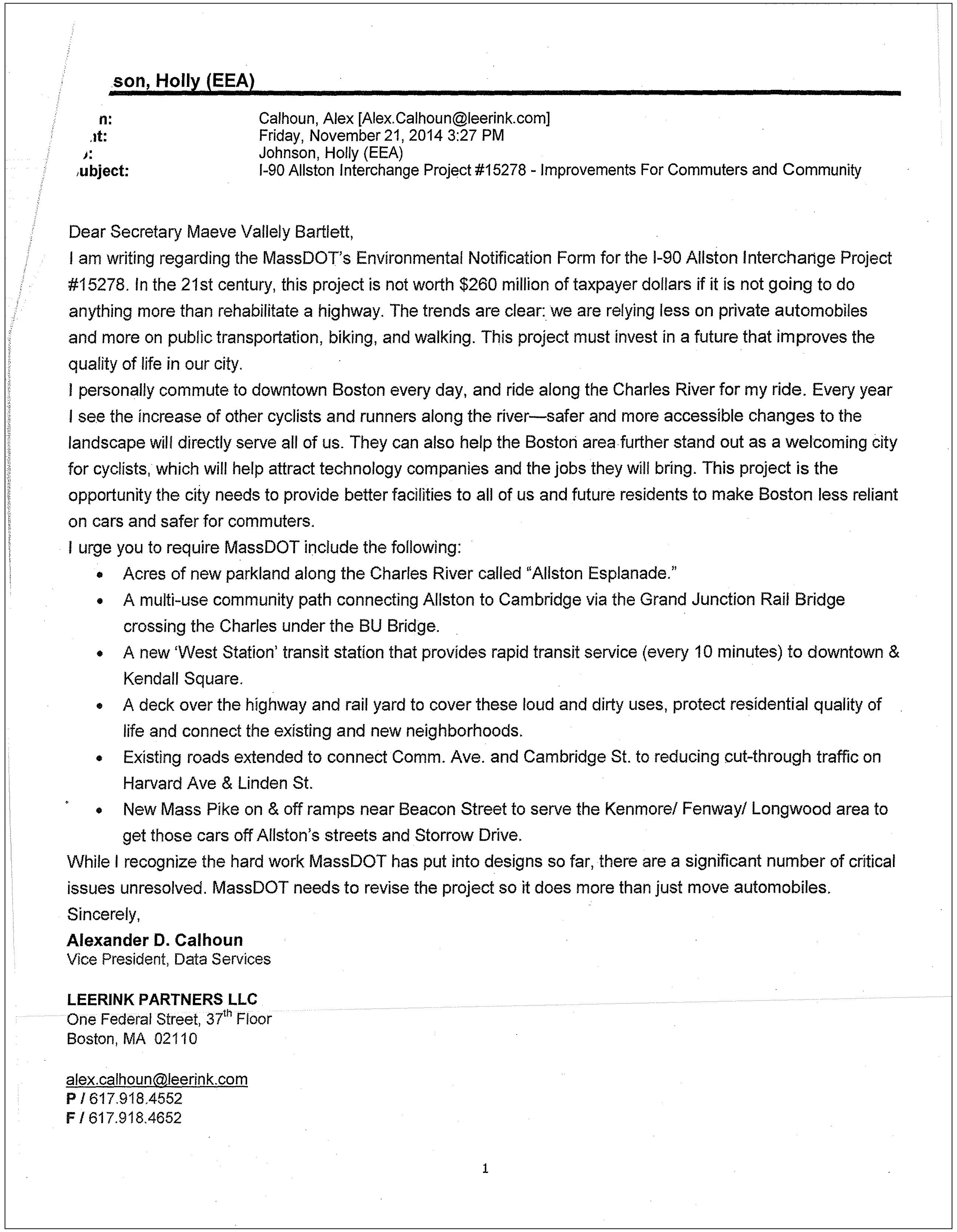
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Jennifer Uhrhane
--
Jennifer Uhrhane
10 Plainfield Street, Apt. 2
Jamaica Plain, MA 02130
jenuphoto@gmail.com



son, Holly (EEA)

n: Calhoun, Alex [Alex.Calhoun@leerink.com]
nt: Friday, November 21, 2014 3:27 PM
: Johnson, Holly (EEA)
ubject: I-90 Allston Interchange Project #15278 - Improvements For Commuters and Community

Dear Secretary Maeve Vallely Bartlett,

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I personally commute to downtown Boston every day, and ride along the Charles River for my ride. Every year I see the increase of other cyclists and runners along the river—safer and more accessible changes to the landscape will directly serve all of us. They can also help the Boston area further stand out as a welcoming city for cyclists, which will help attract technology companies and the jobs they will bring. This project is the opportunity the city needs to provide better facilities to all of us and future residents to make Boston less reliant on cars and safer for commuters.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Alexander D. Calhoun
Vice President, Data Services

LEERINK PARTNERS LLC
One Federal Street, 37th Floor
Boston, MA 02110

alex.calhoun@leerink.com
P / 617.918.4552
F / 617.918.4652

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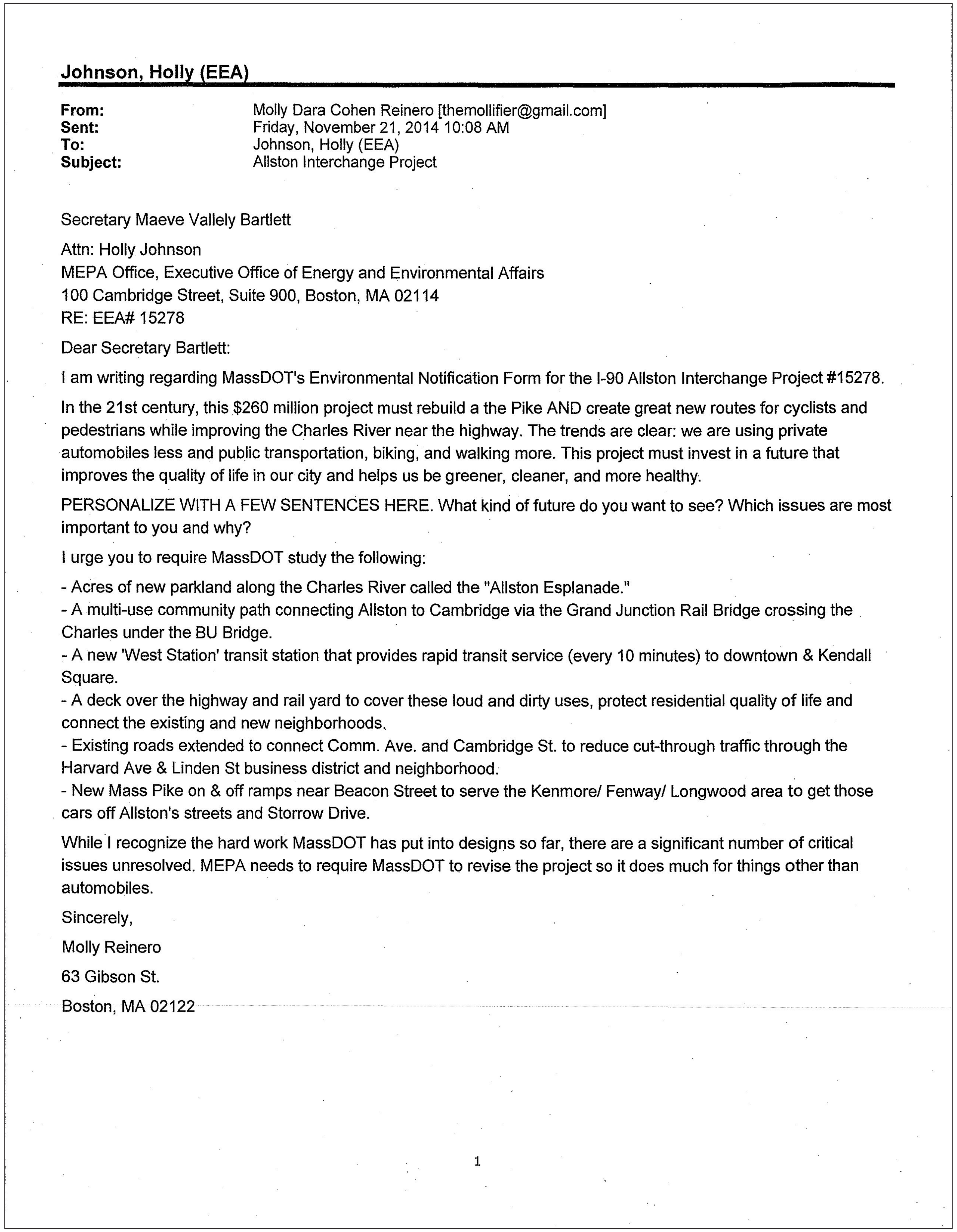

Johnson, Holly (EEA)

From: Molly Dara Cohen Reinero [themollifier@gmail.com]
Sent: Friday, November 21, 2014 10:08 AM
To: Johnson, Holly (EEA)
Subject: Allston Interchange Project

Secretary Maeve Vallely Bartlett

Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

PERSONALIZE WITH A FEW SENTENCES HERE. What kind of future do you want to see? Which issues are most important to you and why?

I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,

Molly Reinero

63 Gibson St.

Boston, MA 02122

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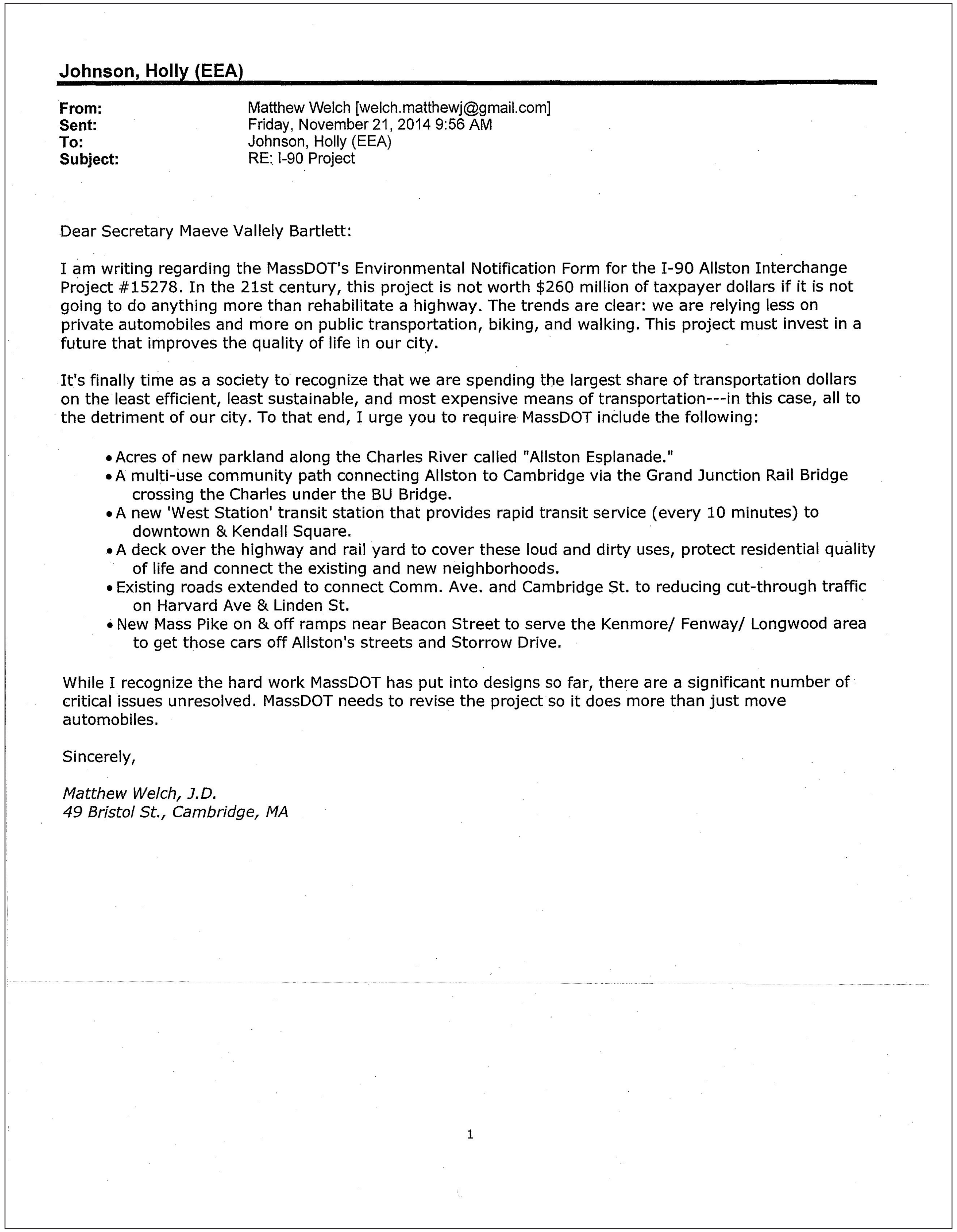

Johnson, Holly (EEA)

From: Matthew Welch [welch.matthewj@gmail.com]
Sent: Friday, November 21, 2014 9:56 AM
To: Johnson, Holly (EEA)
Subject: RE: I-90 Project

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

It's finally time as a society to recognize that we are spending the largest share of transportation dollars on the least efficient, least sustainable, and most expensive means of transportation---in this case, all to the detriment of our city. To that end, I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
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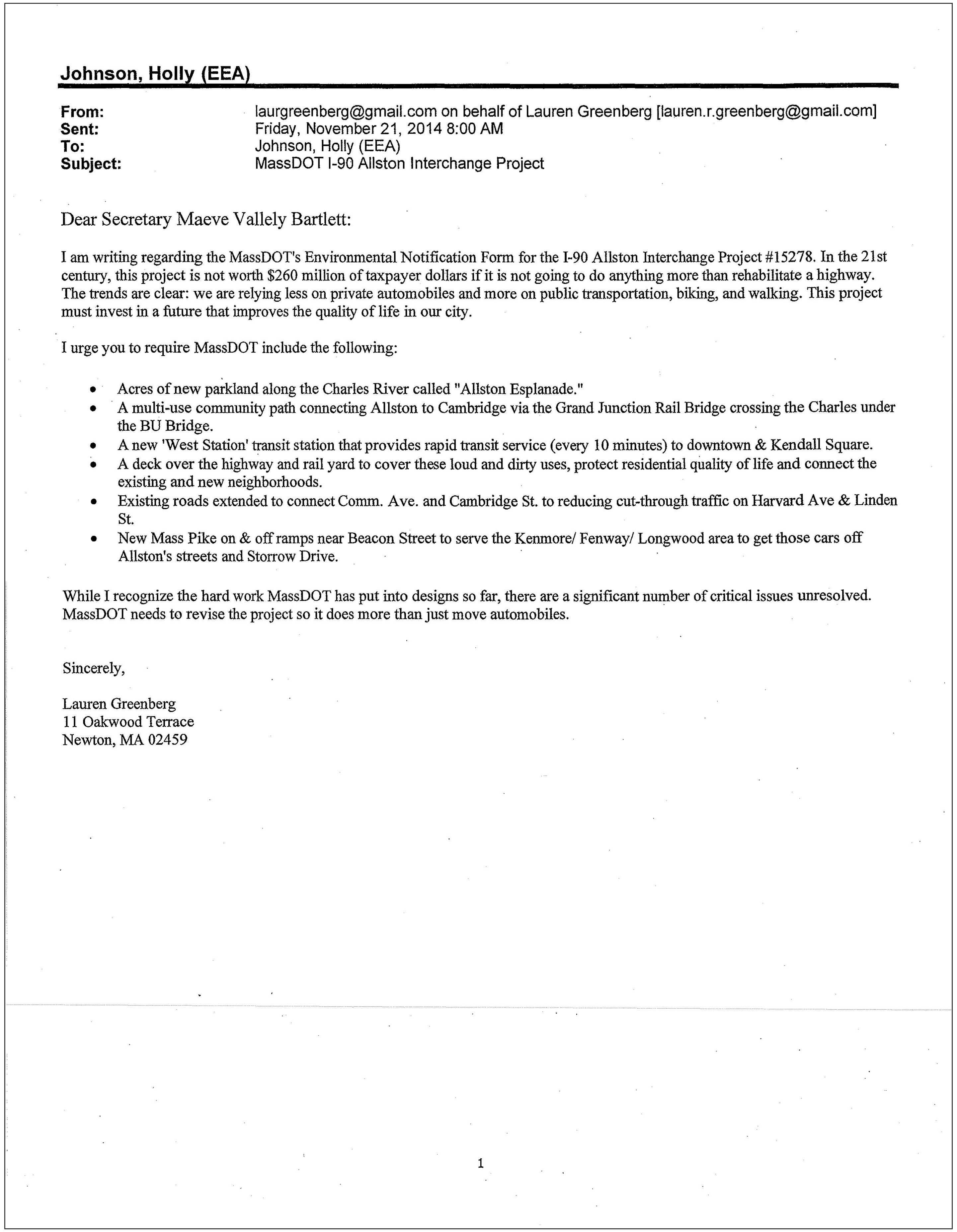
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Matthew Welch, J.D.
49 Bristol St., Cambridge, MA

1



Johnson, Holly (EEA)

From: laurgreenberg@gmail.com on behalf of Lauren Greenberg [lauren.r.greenberg@gmail.com]
Sent: Friday, November 21, 2014 8:00 AM
To: Johnson, Holly (EEA)
Subject: MassDOT I-90 Allston Interchange Project

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
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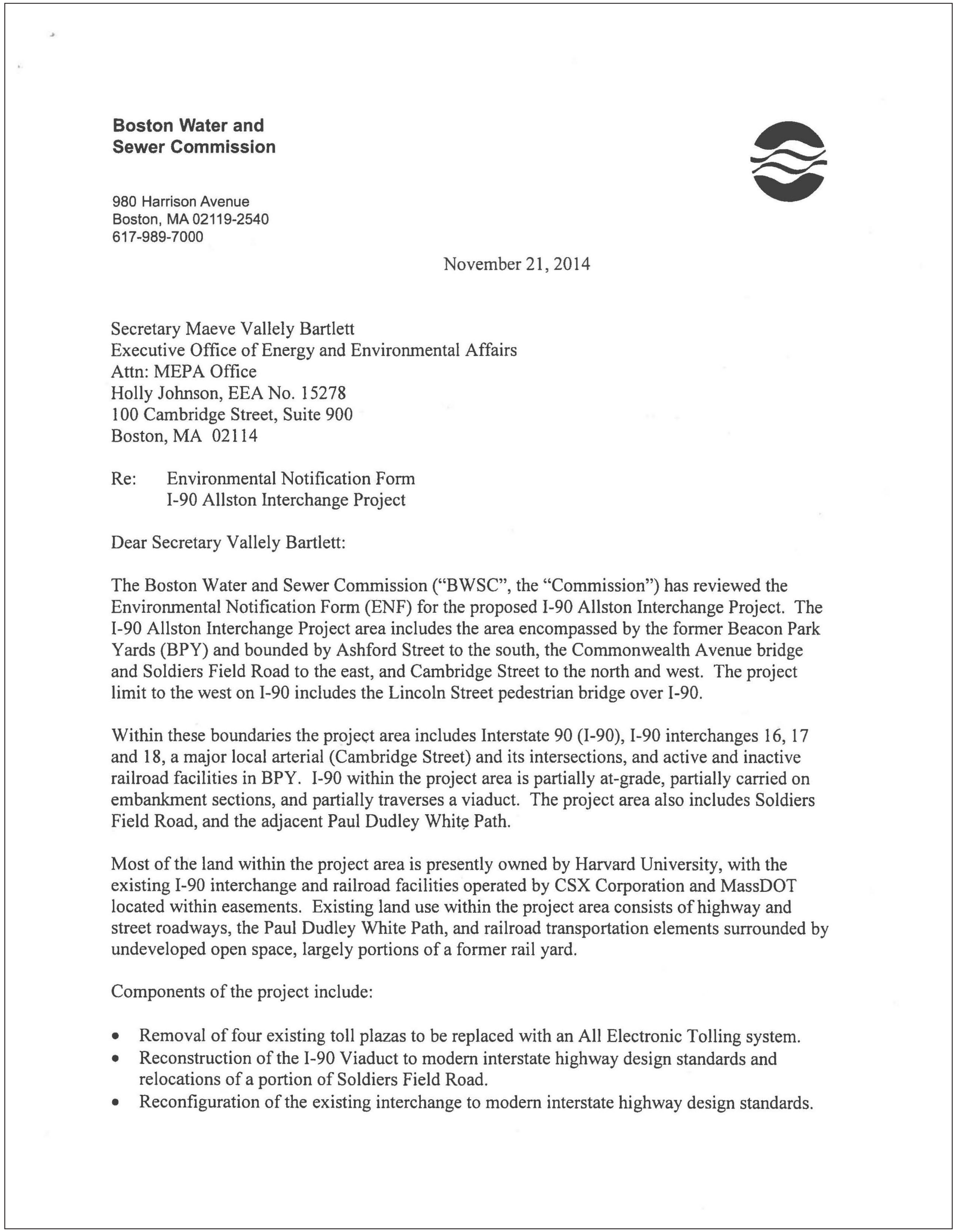
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Lauren Greenberg
11 Oakwood Terrace
Newton, MA 02459

1



Boston Water and
Sewer Commission

980 Harrison Avenue
Boston, MA 02119-2540
617-989-7000

November 21, 2014

Secretary Maeve Vallely Bartlett
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
Holly Johnson, EEA No. 15278
100 Cambridge Street, Suite 900
Boston, MA 02114

Re: Environmental Notification Form
I-90 Allston Interchange Project

Dear Secretary Vallely Bartlett:

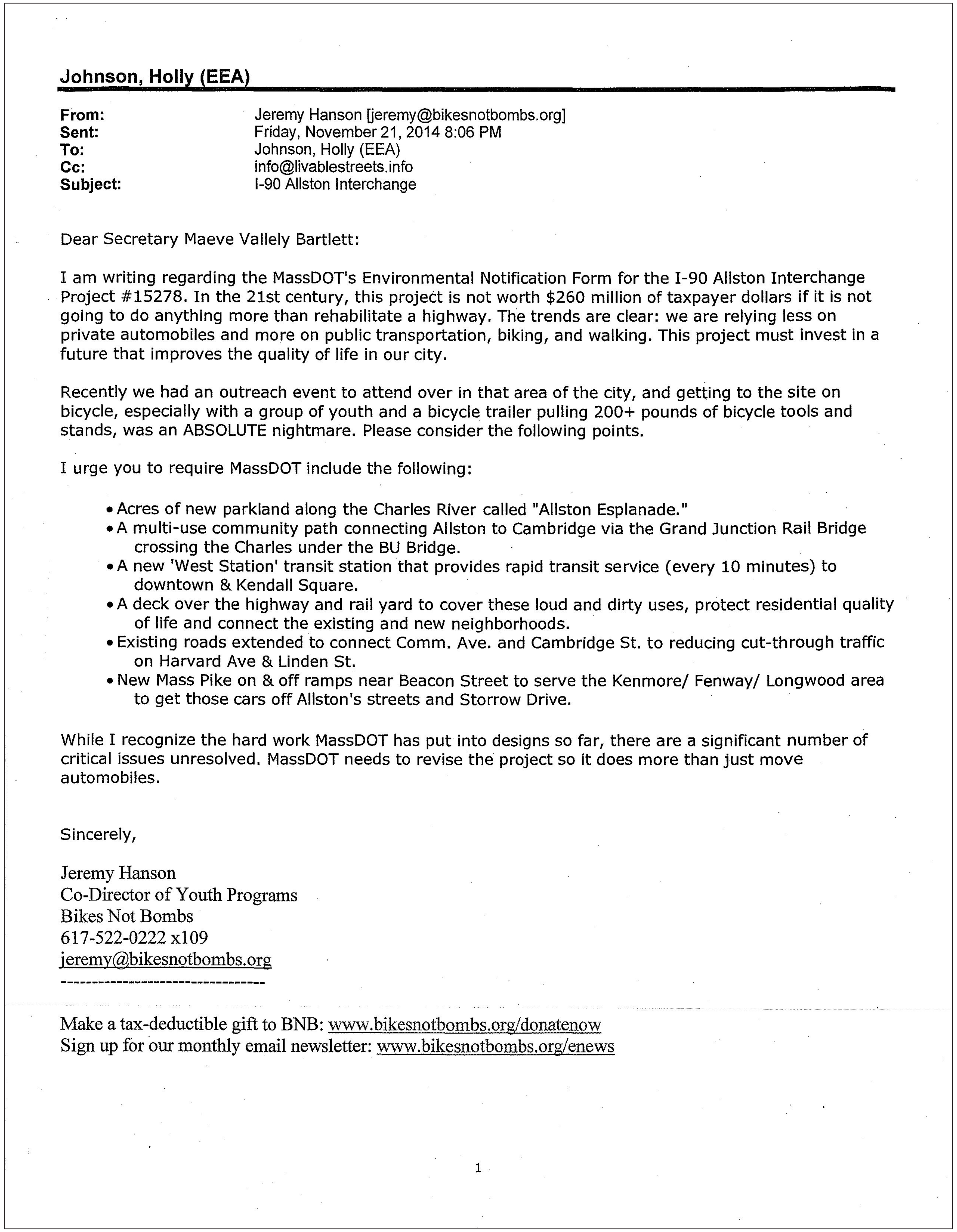
The Boston Water and Sewer Commission ("BWSC", the "Commission") has reviewed the Environmental Notification Form (ENF) for the proposed I-90 Allston Interchange Project. The I-90 Allston Interchange Project area includes the area encompassed by the former Beacon Park Yards (BPY) and bounded by Ashford Street to the south, the Commonwealth Avenue bridge and Soldiers Field Road to the east, and Cambridge Street to the north and west. The project limit to the west on I-90 includes the Lincoln Street pedestrian bridge over I-90.

Within these boundaries the project area includes Interstate 90 (I-90), I-90 interchanges 16, 17 and 18, a major local arterial (Cambridge Street) and its intersections, and active and inactive railroad facilities in BPY. I-90 within the project area is partially at-grade, partially carried on embankment sections, and partially traverses a viaduct. The project area also includes Soldiers Field Road, and the adjacent Paul Dudley White Path.

Most of the land within the project area is presently owned by Harvard University, with the existing I-90 interchange and railroad facilities operated by CSX Corporation and MassDOT located within easements. Existing land use within the project area consists of highway and street roadways, the Paul Dudley White Path, and railroad transportation elements surrounded by undeveloped open space, largely portions of a former rail yard.

Components of the project include:

- Removal of four existing toll plazas to be replaced with an All Electronic Tolling system.
- Reconstruction of the I-90 Viaduct to modern interstate highway design standards and relocations of a portion of Soldiers Field Road.
- Reconfiguration of the existing interchange to modern interstate highway design standards.



Johnson, Holly (EEA)

From: Jeremy Hanson [jeremy@bikesnotbombs.org]
Sent: Friday, November 21, 2014 8:06 PM
To: Johnson, Holly (EEA)
Cc: info@livablestreets.info
Subject: I-90 Allston Interchange

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

Recently we had an outreach event to attend over in that area of the city, and getting to the site on bicycle, especially with a group of youth and a bicycle trailer pulling 200+ pounds of bicycle tools and stands, was an ABSOLUTE nightmare. Please consider the following points.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Jeremy Hanson
Co-Director of Youth Programs
Bikes Not Bombs
617-522-0222 x109
jeremy@bikesnotbombs.org

Make a tax-deductible gift to BNB: www.bikesnotbombs.org/donatenow
Sign up for our monthly email newsletter: www.bikesnotbombs.org/enews

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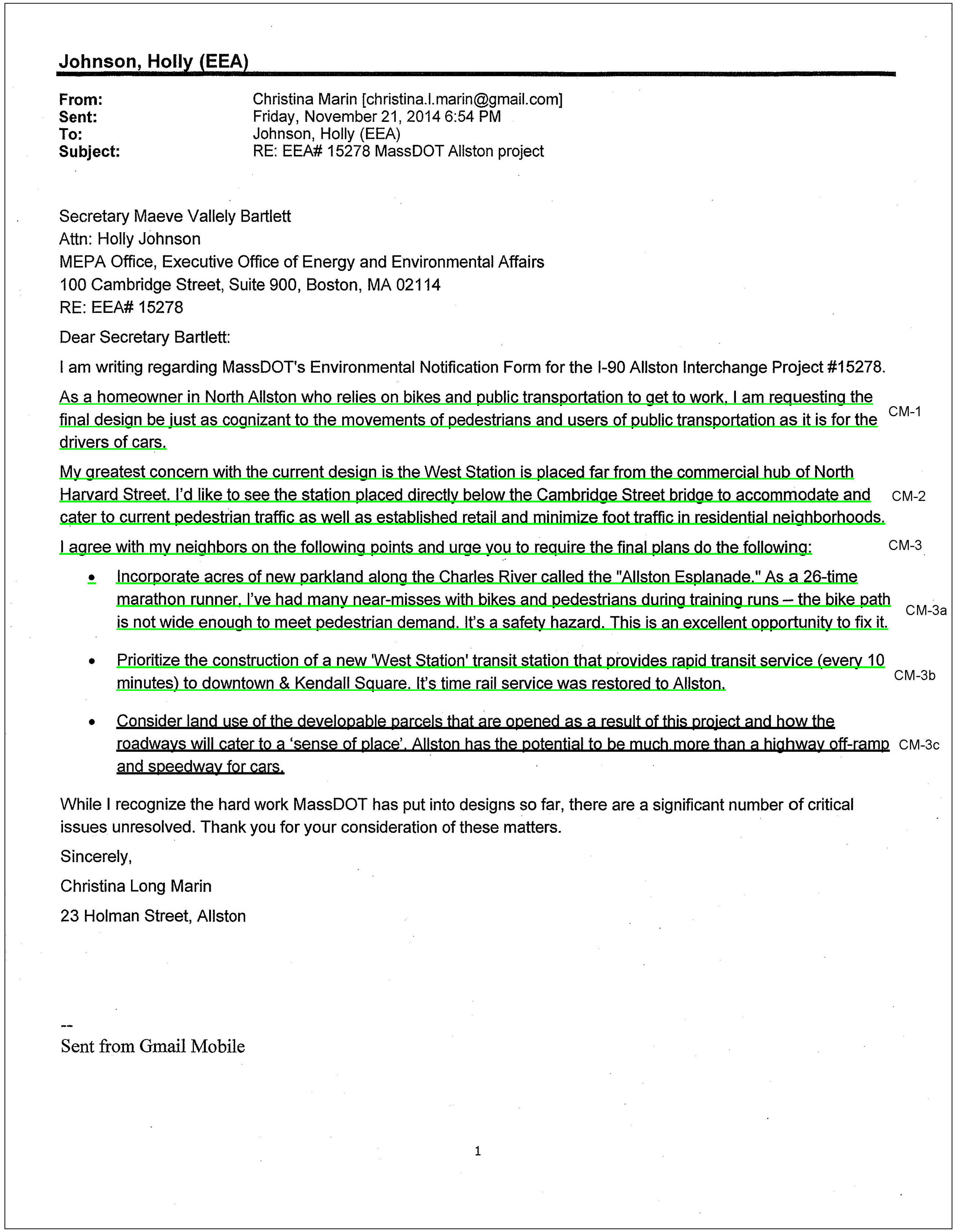

Johnson, Holly (EEA)

From: Christina Marin [christina.l.marin@gmail.com]
Sent: Friday, November 21, 2014 6:54 PM
To: Johnson, Holly (EEA)
Subject: RE: EEA# 15278 MassDOT Allston project

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

As a homeowner in North Allston who relies on bikes and public transportation to get to work, I am requesting the final design be just as cognizant to the movements of pedestrians and users of public transportation as it is for the drivers of cars. CM-1

My greatest concern with the current design is the West Station is placed far from the commercial hub of North Harvard Street. I'd like to see the station placed directly below the Cambridge Street bridge to accommodate and cater to current pedestrian traffic as well as established retail and minimize foot traffic in residential neighborhoods. CM-2

I agree with my neighbors on the following points and urge you to require the final plans do the following: CM-3

- Incorporate acres of new parkland along the Charles River called the "Allston Esplanade." As a 26-time marathon runner, I've had many near-misses with bikes and pedestrians during training runs – the bike path is not wide enough to meet pedestrian demand. It's a safety hazard. This is an excellent opportunity to fix it. CM-3a
- Prioritize the construction of a new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square. It's time rail service was restored to Allston. CM-3b
- Consider land use of the developable parcels that are opened as a result of this project and how the roadways will cater to a 'sense of place'. Allston has the potential to be much more than a highway off-ramp and speedway for cars. CM-3c

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. Thank you for your consideration of these matters.

Sincerely,

Christina Long Marin

23 Holman Street, Allston

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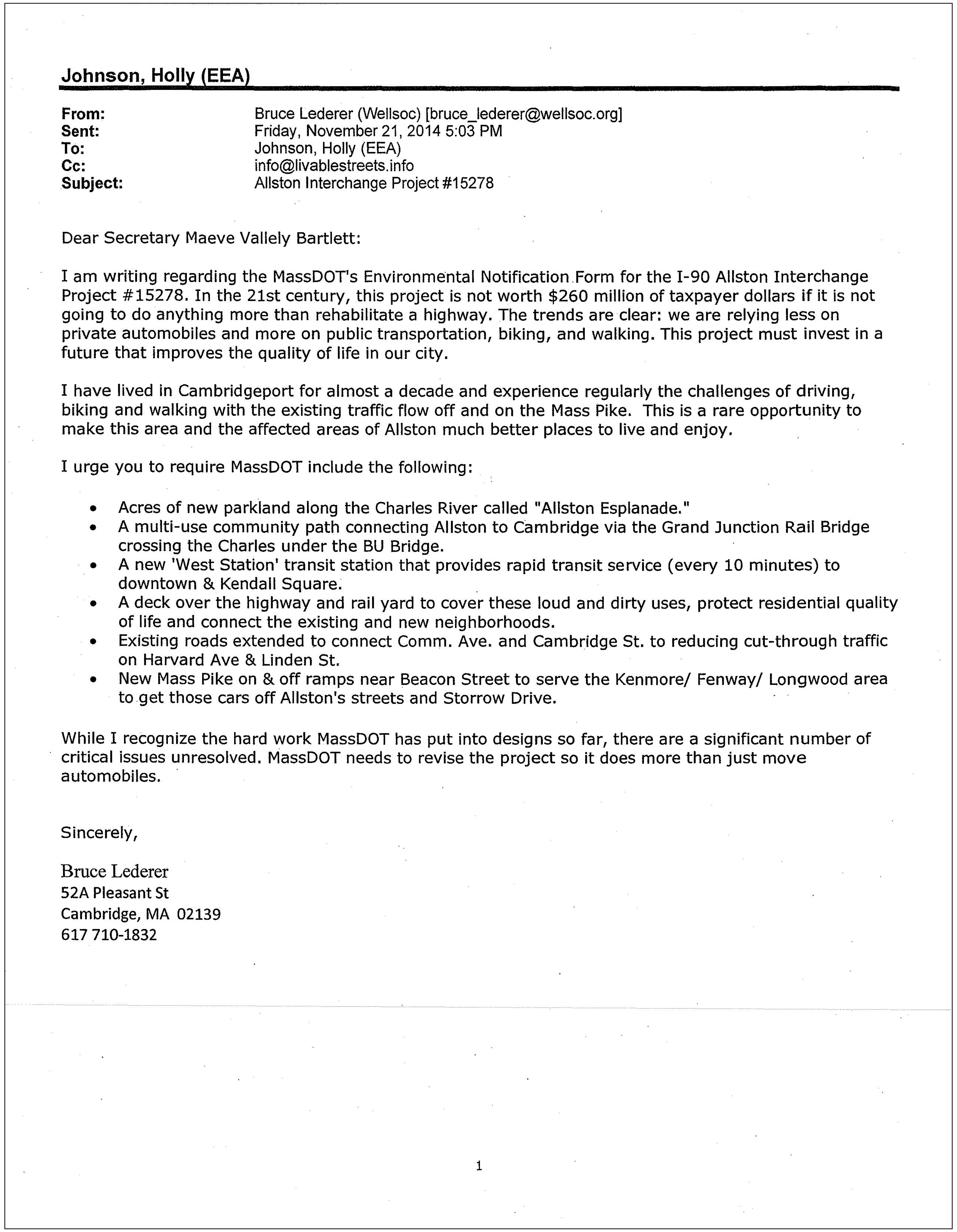
Sent from Gmail Mobile



Johnson, Holly (EEA)

From: Bruce Lederer (Wellsoc) [bruce_lederer@wellsoc.org]
Sent: Friday, November 21, 2014 5:03 PM
To: Johnson, Holly (EEA)
Cc: info@livablestreets.info
Subject: Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I have lived in Cambridgeport for almost a decade and experience regularly the challenges of driving, biking and walking with the existing traffic flow off and on the Mass Pike. This is a rare opportunity to make this area and the affected areas of Allston much better places to live and enjoy.

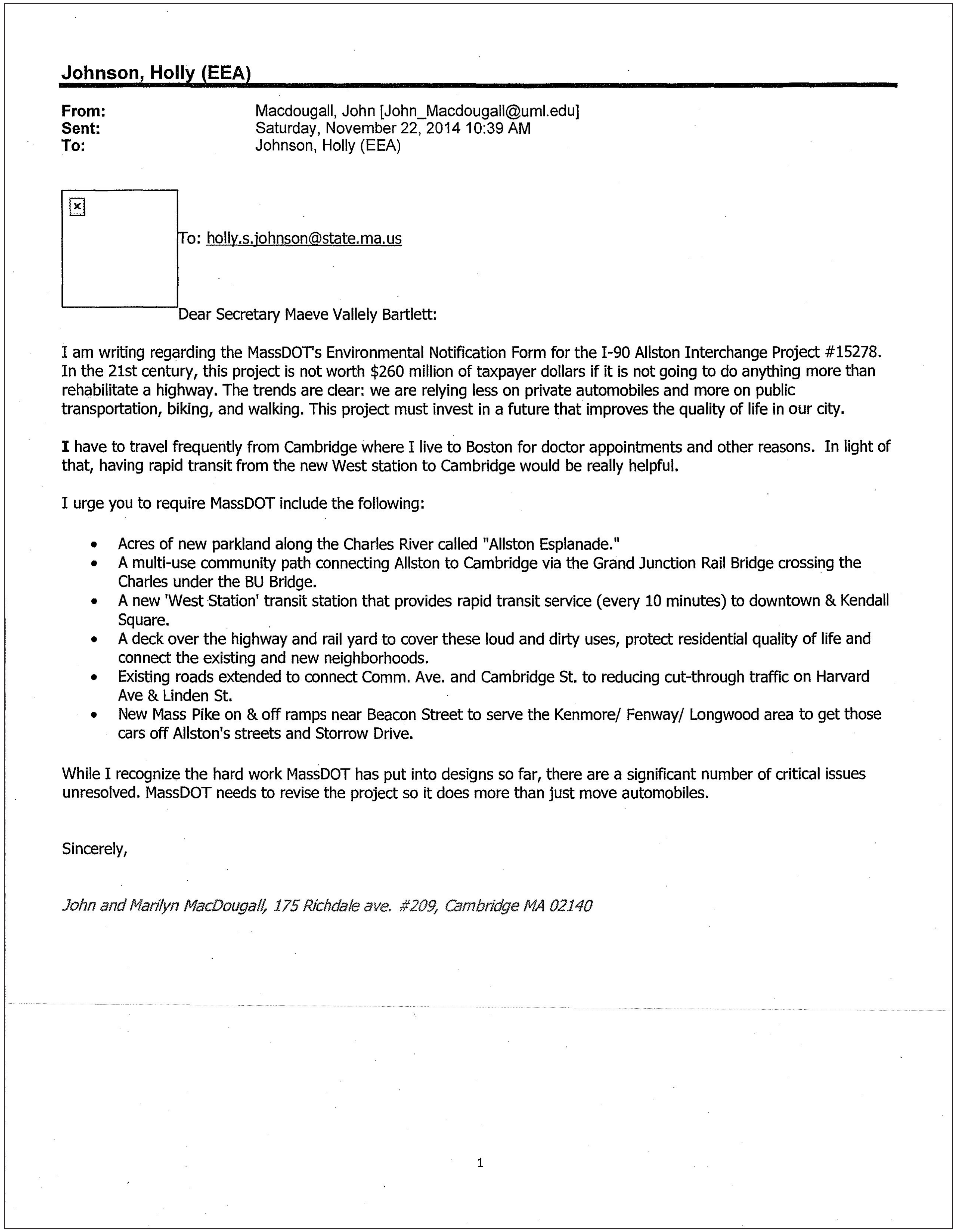
I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Bruce Lederer
52A Pleasant St
Cambridge, MA 02139
617 710-1832



Johnson, Holly (EEA)

From: Macdougall, John [John_Macdougall@uml.edu]
Sent: Saturday, November 22, 2014 10:39 AM
To: Johnson, Holly (EEA)

To: holly.s.johnson@state.ma.us

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I have to travel frequently from Cambridge where I live to Boston for doctor appointments and other reasons. In light of that, having rapid transit from the new West station to Cambridge would be really helpful.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
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While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

John and Marilyn MacDougall, 175 Richdale ave. #209, Cambridge MA 02140

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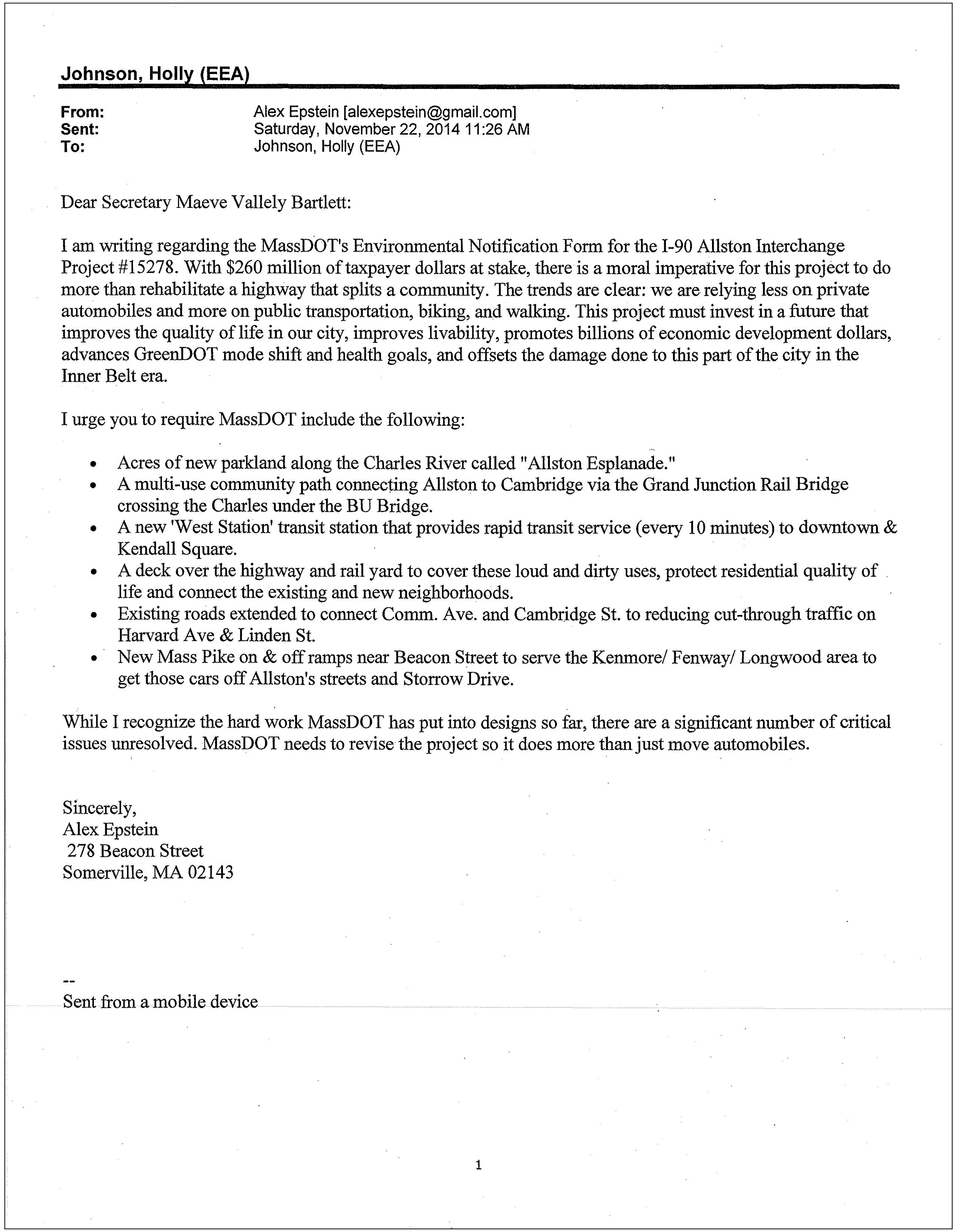

Johnson, Holly (EEA)

From: Alex Epstein [alexepstein@gmail.com]
Sent: Saturday, November 22, 2014 11:26 AM
To: Johnson, Holly (EEA)

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. With $260 million of taxpayer dollars at stake, there is a moral imperative for this project to do more than rehabilitate a highway that splits a community. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city, improves livability, promotes billions of economic development dollars, advances GreenDOT mode shift and health goals, and offsets the damage done to this part of the city in the Inner Belt era.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
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While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,
Alex Epstein
278 Beacon Street
Somerville, MA 02143

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Sent from a mobile device

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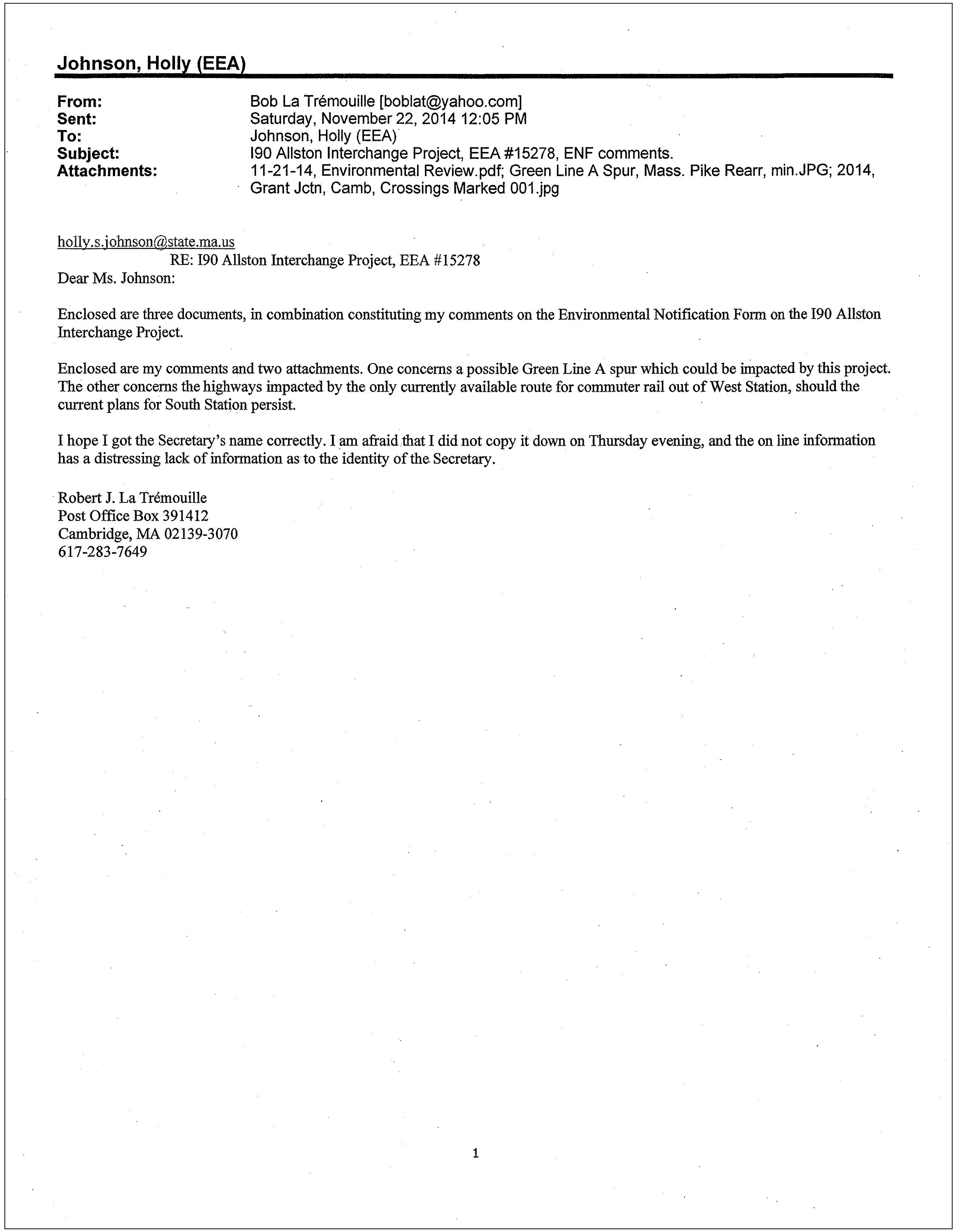

Johnson, Holly (EEA)

From:	Bob La Trémouille [boblat@yahoo.com]
Sent:	Saturday, November 22, 2014 12:05 PM
To:	Johnson, Holly (EEA)
Subject:	I90 Allston Interchange Project, EEA #15278, ENF comments.
Attachments:	11-21-14, Environmental Review.pdf; Green Line A Spur, Mass. Pike Rearr, min.JPG; 2014, Grant Jctn, Camb, Crossings Marked 001.jpg

holly.s.johnson@state.ma.us
RE: I90 Allston Interchange Project, EEA #15278
Dear Ms. Johnson:

Enclosed are three documents, in combination constituting my comments on the Environmental Notification Form on the I90 Allston Interchange Project.

Enclosed are my comments and two attachments. One concerns a possible Green Line A spur which could be impacted by this project. The other concerns the highways impacted by the only currently available route for commuter rail out of West Station, should the current plans for South Station persist.

I hope I got the Secretary's name correctly. I am afraid that I did not copy it down on Thursday evening, and the on line information has a distressing lack of information as to the identity of the Secretary.

Robert J. La Trémouille
Post Office Box 391412
Cambridge, MA 02139-3070
617-283-7649

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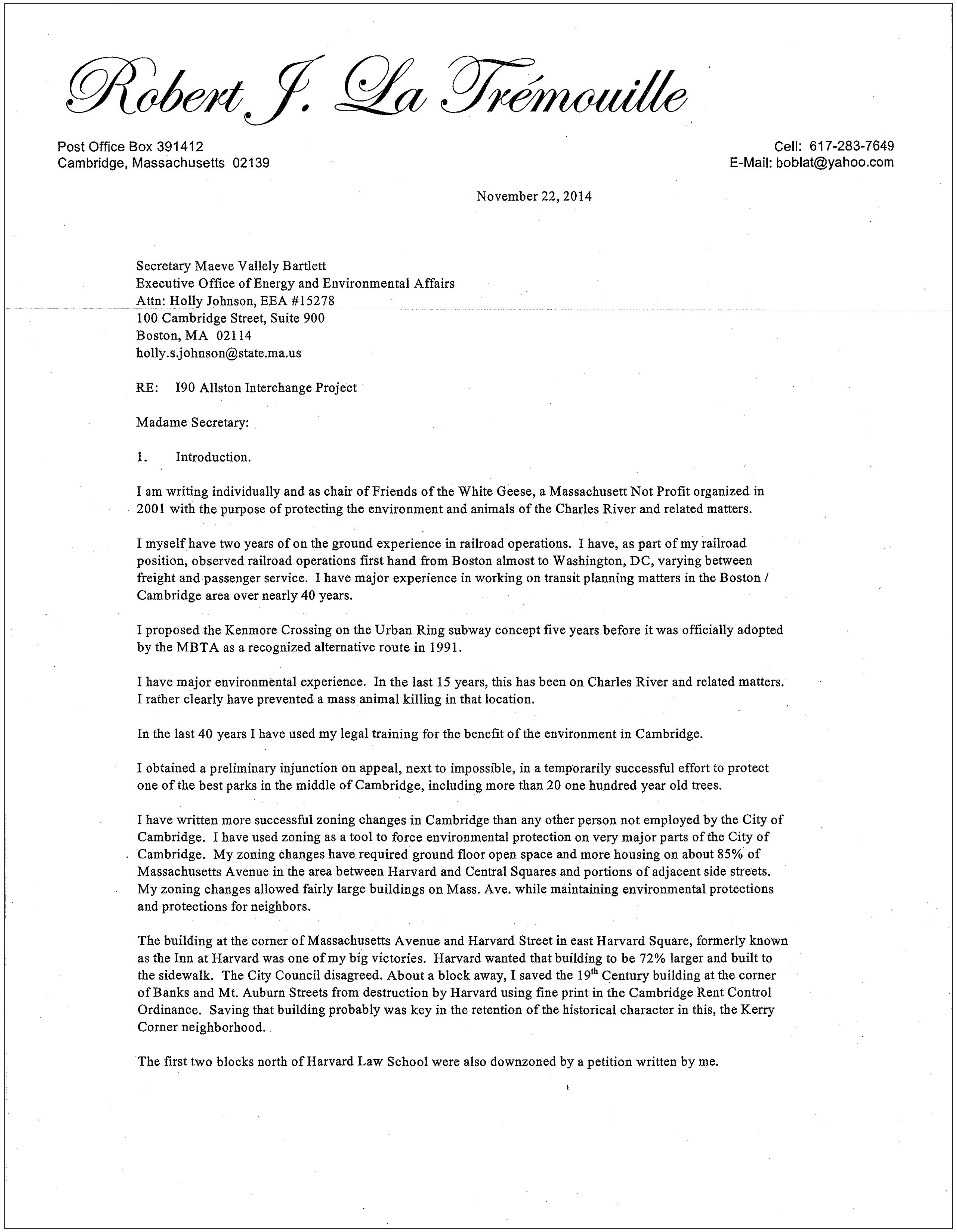


Robert J. La Trémouille

Post Office Box 391412
Cambridge, Massachusetts 02139

Cell: 617-283-7649
E-Mail: boblat@yahoo.com

November 22, 2014

Secretary Maeve Vallely Bartlett
Executive Office of Energy and Environmental Affairs
Attn: Holly Johnson, EEA #15278
100 Cambridge Street, Suite 900
Boston, MA 02114
holly.s.johnson@state.ma.us

RE: I90 Allston Interchange Project

Madame Secretary:

1. Introduction.

I am writing individually and as chair of Friends of the White Geese, a Massachusett Not Profit organized in 2001 with the purpose of protecting the environment and animals of the Charles River and related matters.

I myself have two years of on the ground experience in railroad operations. I have, as part of my railroad position, observed railroad operations first hand from Boston almost to Washington, DC, varying between freight and passenger service. I have major experience in working on transit planning matters in the Boston / Cambridge area over nearly 40 years.

I proposed the Kenmore Crossing on the Urban Ring subway concept five years before it was officially adopted by the MBTA as a recognized alternative route in 1991.

I have major environmental experience. In the last 15 years, this has been on Charles River and related matters. I rather clearly have prevented a mass animal killing in that location.

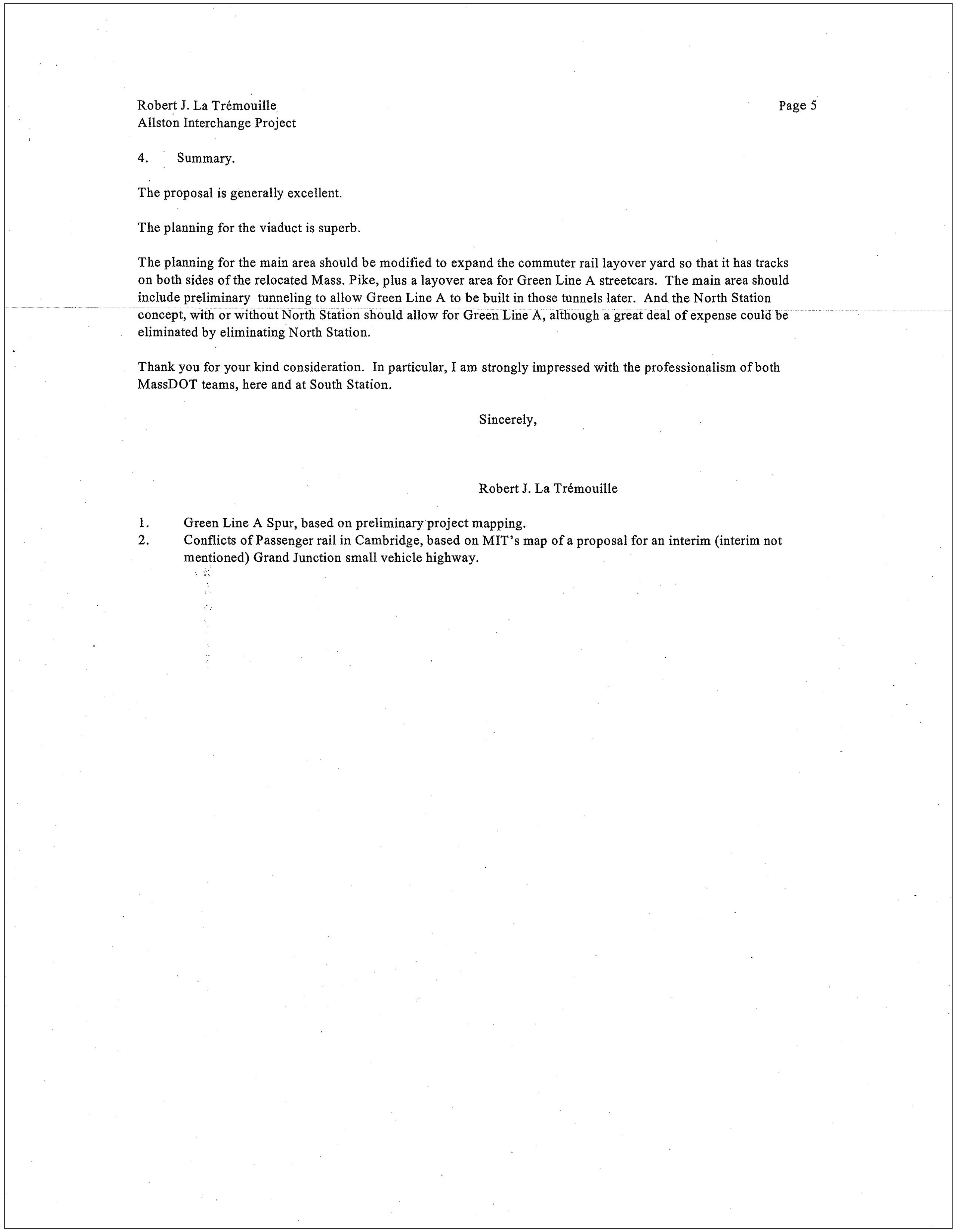
In the last 40 years I have used my legal training for the benefit of the environment in Cambridge.

I obtained a preliminary injunction on appeal, next to impossible, in a temporarily successful effort to protect one of the best parks in the middle of Cambridge, including more than 20 one hundred year old trees.

I have written more successful zoning changes in Cambridge than any other person not employed by the City of Cambridge. I have used zoning as a tool to force environmental protection on very major parts of the City of Cambridge. My zoning changes have required ground floor open space and more housing on about 85% of Massachusetts Avenue in the area between Harvard and Central Squares and portions of adjacent side streets. My zoning changes allowed fairly large buildings on Mass. Ave. while maintaining environmental protections and protections for neighbors.

The building at the corner of Massachusetts Avenue and Harvard Street in east Harvard Square, formerly known as the Inn at Harvard was one of my big victories. Harvard wanted that building to be 72% larger and built to the sidewalk. The City Council disagreed. About a block away, I saved the 19th Century building at the corner of Banks and Mt. Auburn Streets from destruction by Harvard using fine print in the Cambridge Rent Control Ordinance. Saving that building probably was key in the retention of the historical character in this, the Kerry Corner neighborhood.

The first two blocks north of Harvard Law School were also downzoned by a petition written by me.



4. Summary.

The proposal is generally excellent.

The planning for the viaduct is superb.

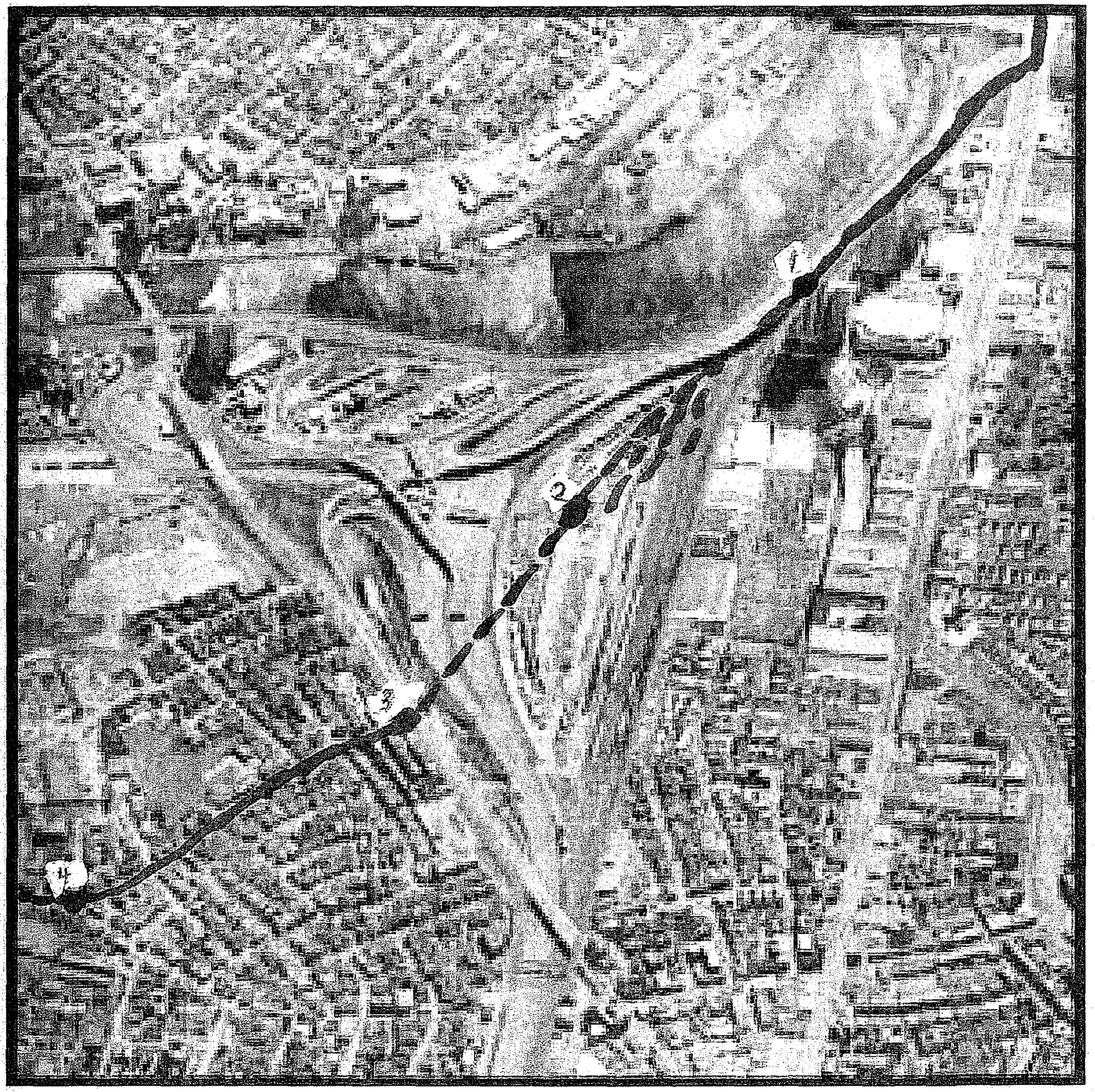
The planning for the main area should be modified to expand the commuter rail layover yard so that it has tracks on both sides of the relocated Mass. Pike, plus a layover area for Green Line A streetcars. The main area should include preliminary tunneling to allow Green Line A to be built in those tunnels later. And the North Station concept, with or without North Station should allow for Green Line A, although a great deal of expense could be eliminated by eliminating North Station.

Thank you for your kind consideration. In particular, I am strongly impressed with the professionalism of both MassDOT teams, here and at South Station.

Sincerely,

Robert J. La Trémouille

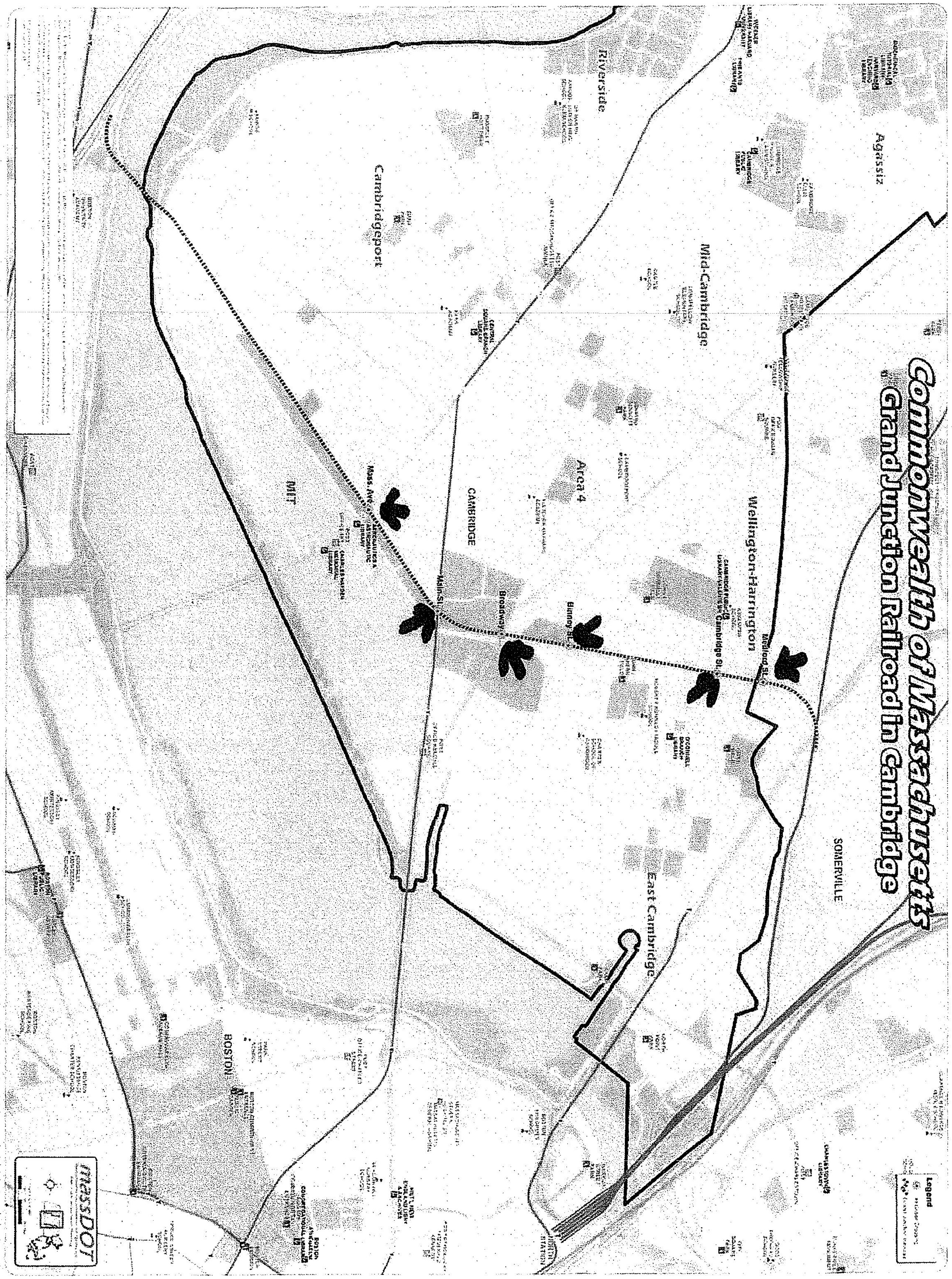
1. Green Line A Spur, based on preliminary project mapping.
2. Conflicts of Passenger rail in Cambridge, based on MIT's map of a proposal for an interim (interim not mentioned) Grand Junction small vehicle highway.

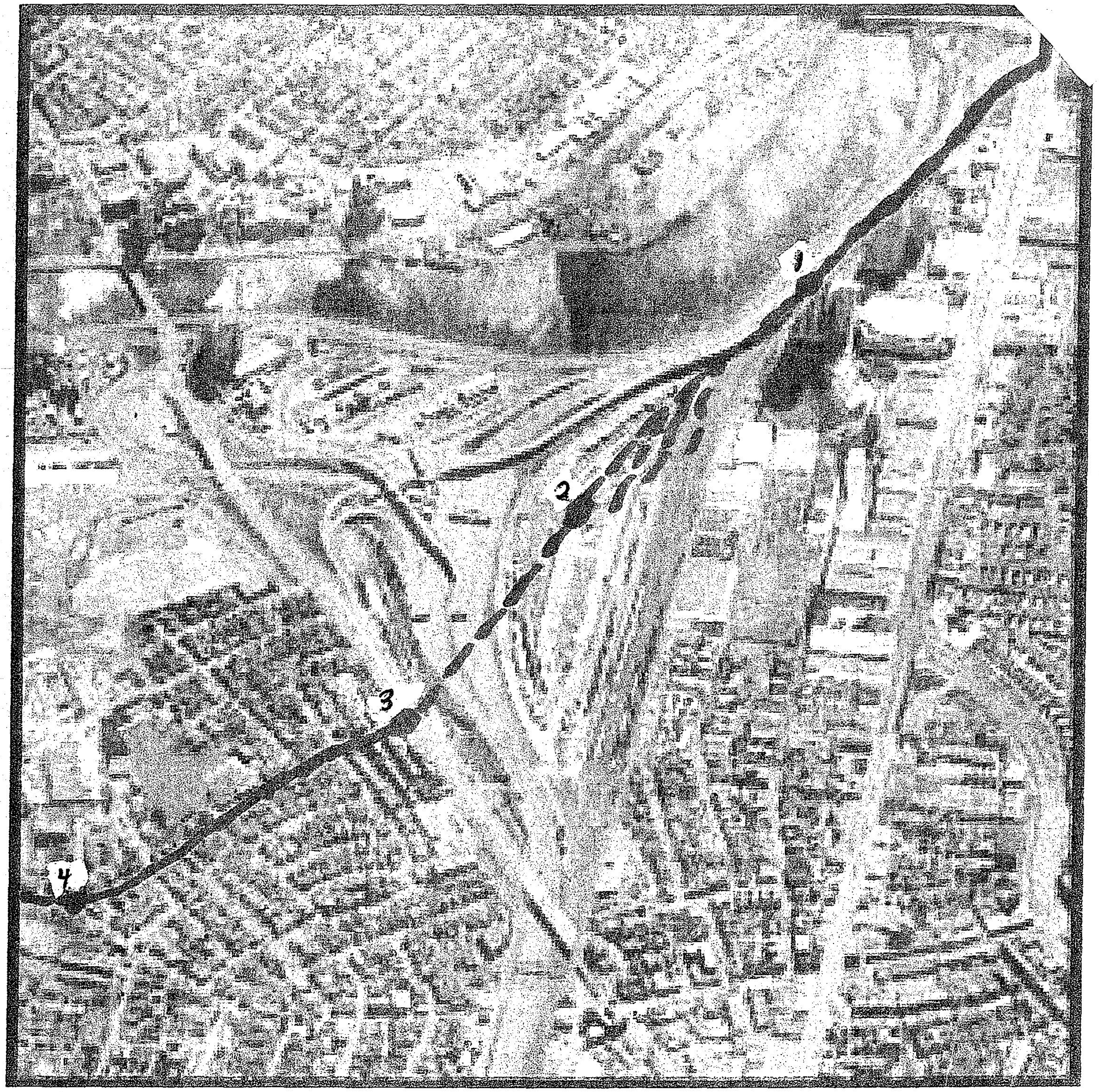


GREEN LINE A SPUR

Comes off Green Line B over Mass. Pike / main line. Runs between Mass. Pike viaduct and Boston Univ.. Elevated until after stop 1 then goes underground either before or after stop 2. Harvard Medical School route to be determined. Goes under North Harvard Street to after stop 5. Turns west south of Harvard Stadium, then north west of Harvard Stadium. Layover facility underground west of Harvard Stadium. Single track under Charles River. Connects to existing tunnel from Harvard Station which continues to exist in the wall between JFK School and Charles Hotel. Direct stub end connection to Harvard Station bus tunnel by removing dividing wall.

1. Boston University Highrise Dorms / Auditorium
2. Harvard Medical School (route tentative) with storage yards.
3. North Harvard and Cambridge.
4. North Harvard and Franklin.
5. Harvard Business School / Stadium.


Commonwealth of Massachusetts
Grand Junction Railroad in Cambridge
Agassiz
Riverside
Cambridgeport
Mid-Cambridge
Wellington-Harrington
Area 4
CAMBRIDGE
MIT
East Cambridge
SOMERVILLE
BOSTON
Mass. Ave
Main St
Broadway
Binney St
Cambridge St
Medford St
Legend
massDOT



GREEN LINE A SPUR

Comes off Green Line B over Mass. Pike / main line. Runs between Mass. Pike viaduct and Boston Univ. Elevated until after stop 1 then goes underground either before or after stop 2. Harvard Medical School route to be determined. Goes under North Harvard Street to after stop 5. Turns west south of Harvard Stadium, then north west of Harvard Stadium. Layover facility underground west of Harvard Stadium. Single track under Charles River. Connects to existing tunnel from Harvard Station which continues to exist in the wall between JFK School and Charles Hotel. Direct stub end connection to Harvard Station bus tunnel by removing dividing wall.

1. Boston University Highrise Dorms / Auditorium
2. Harvard Medical School (route tentative) with storage yards.
3. North Harvard and Cambridge.
4. North Harvard and Franklin.
5. Harvard Business School / Stadium.

Johnson, Holly (EEA)

From: Bob La Trémouille [boblat@yahoo.com]
Sent: Monday, December 08, 2014 1:55 PM
To: Johnson, Holly (EEA)
Subject: I90 Allston Interchange Project, EEA #15278, ENF Comments EEA #15278, Modification of submittal of November 22, 2014
Attachments: 12-08-14, Amendment of submittal.pdf

holly.s.johnson@state.ma.us
RE: I90 Allston Interchange Project, EEA #15278, ENF Comments EEA #15278
Modification of submittal of November 22, 2014

Dear Ms. Johnson:

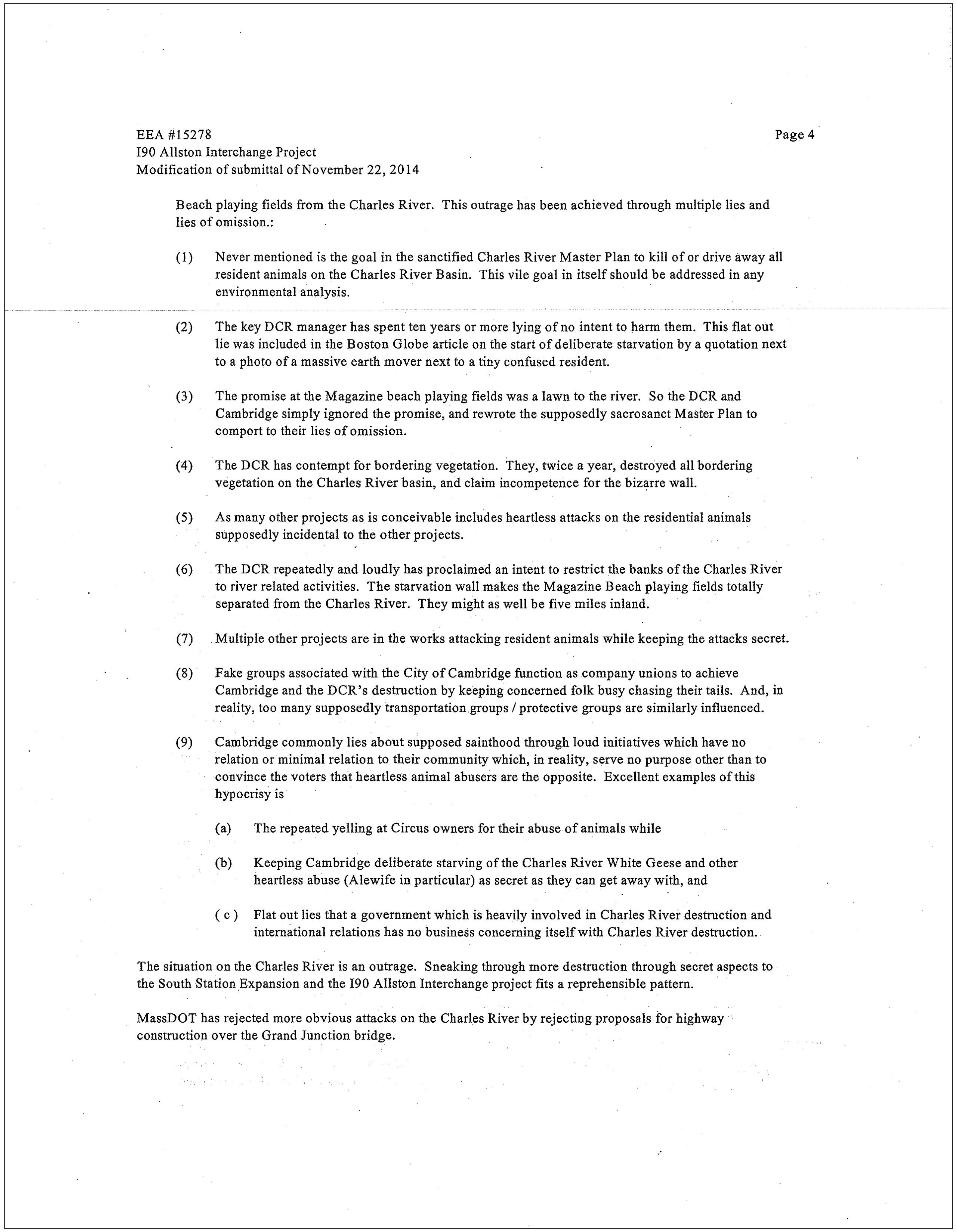
Enclosed as described there in is my second submittal with regard to EEA #15278.

This modifies the existing submittal to add further thoughts which I developed while working on the South Station Expansion project.

This modification tracks the changes to the South Station Expansion submittal. It in no way replaces any portion of the previous I90 Allston Interchange Project submittal except to add these additional thoughts.

Thank you in advance for your time and consideration.

Robert J. La Trémouille
Post Office Box 391412
Cambridge, MA 02139-3070
617-283-7649



EEA #15278 Page 4
I90 Allston Interchange Project
Modification of submittal of November 22, 2014

Beach playing fields from the Charles River. This outrage has been achieved through multiple lies and lies of omission.:

(1) Never mentioned is the goal in the sanctified Charles River Master Plan to kill of or drive away all resident animals on the Charles River Basin. This vile goal in itself should be addressed in any environmental analysis.

(2) The key DCR manager has spent ten years or more lying of no intent to harm them. This flat out lie was included in the Boston Globe article on the start of deliberate starvation by a quotation next to a photo of a massive earth mover next to a tiny confused resident.

(3) The promise at the Magazine beach playing fields was a lawn to the river. So the DCR and Cambridge simply ignored the promise, and rewrote the supposedly sacrosanct Master Plan to comport to their lies of omission.

(4) The DCR has contempt for bordering vegetation. They, twice a year, destroyed all bordering vegetation on the Charles River basin, and claim incompetence for the bizarre wall.

(5) As many other projects as is conceivable includes heartless attacks on the residential animals supposedly incidental to the other projects.

(6) The DCR repeatedly and loudly has proclaimed an intent to restrict the banks of the Charles River to river related activities. The starvation wall makes the Magazine Beach playing fields totally separated from the Charles River. They might as well be five miles inland.

(7) Multiple other projects are in the works attacking resident animals while keeping the attacks secret.

(8) Fake groups associated with the City of Cambridge function as company unions to achieve Cambridge and the DCR's destruction by keeping concerned folk busy chasing their tails. And, in reality, too many supposedly transportation groups / protective groups are similarly influenced.

(9) Cambridge commonly lies about supposed sainthood through loud initiatives which have no relation or minimal relation to their community which, in reality, serve no purpose other than to convince the voters that heartless animal abusers are the opposite. Excellent examples of this hypocrisy is

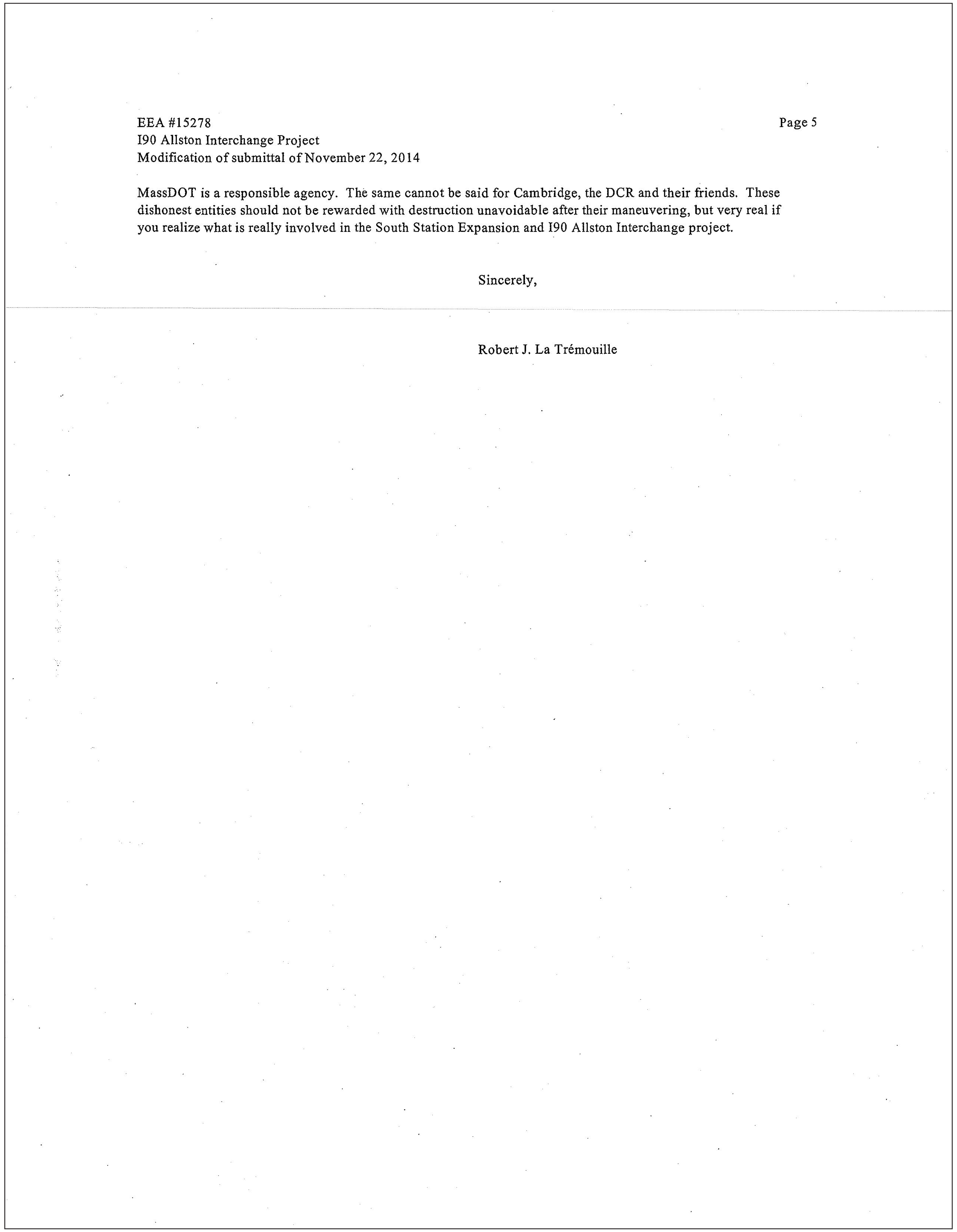
  (a) The repeated yelling at Circus owners for their abuse of animals while

  (b) Keeping Cambridge deliberate starving of the Charles River White Geese and other heartless abuse (Alewife in particular) as secret as they can get away with, and

  (c) Flat out lies that a government which is heavily involved in Charles River destruction and international relations has no business concerning itself with Charles River destruction.

The situation on the Charles River is an outrage. Sneaking through more destruction through secret aspects to the South Station Expansion and the I90 Allston Interchange project fits a reprehensible pattern.

MassDOT has rejected more obvious attacks on the Charles River by rejecting proposals for highway construction over the Grand Junction bridge.

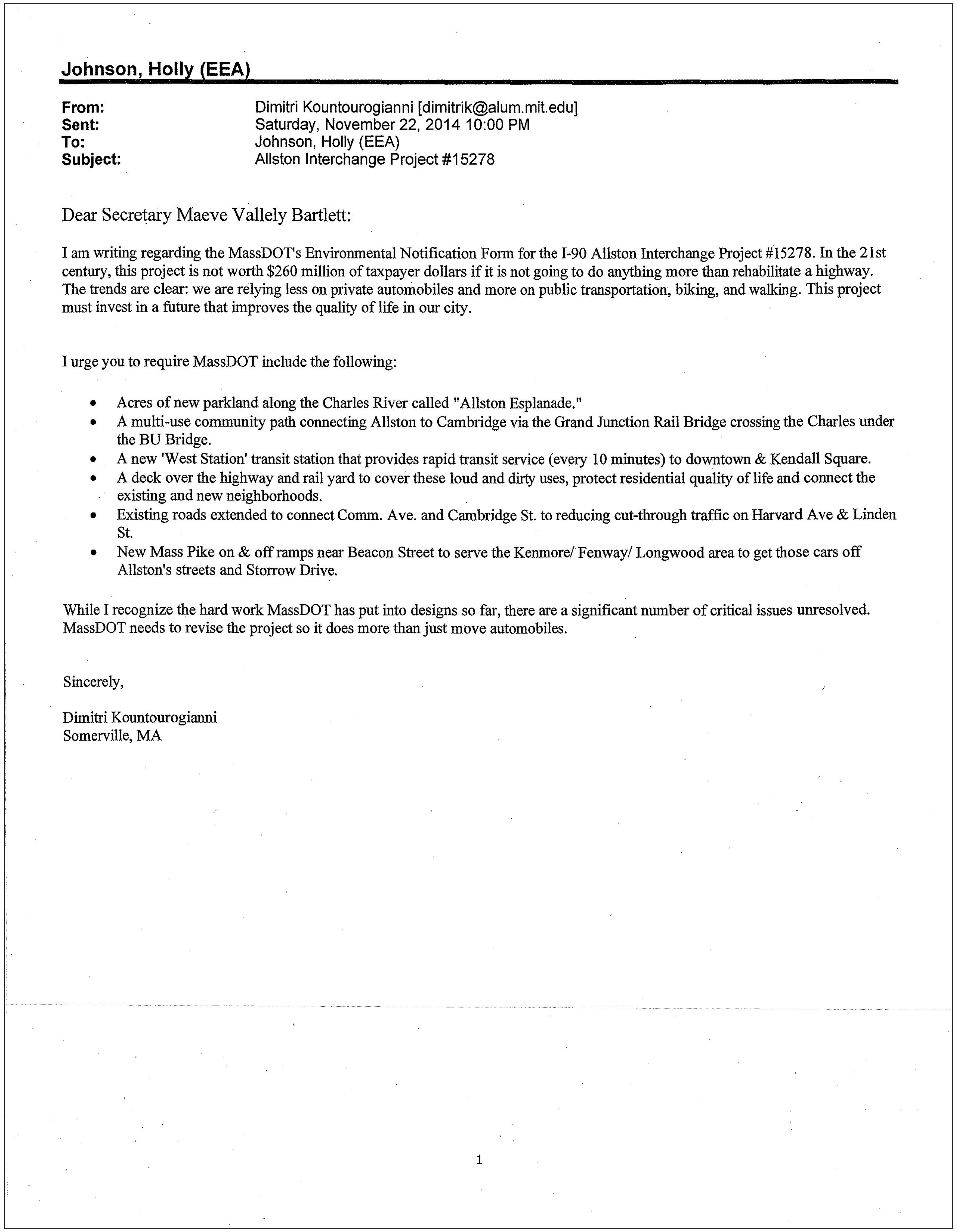


EEA #15278 Page 5
I90 Allston Interchange Project
Modification of submittal of November 22, 2014

MassDOT is a responsible agency. The same cannot be said for Cambridge, the DCR and their friends. These dishonest entities should not be rewarded with destruction unavoidable after their maneuvering, but very real if you realize what is really involved in the South Station Expansion and I90 Allston Interchange project.

Sincerely,

Robert J. La Trémouille



Johnson, Holly (EEA)

From: Dimitri Kountourogianni [dimitrik@alum.mit.edu]
Sent: Saturday, November 22, 2014 10:00 PM
To: Johnson, Holly (EEA)
Subject: Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Dimitri Kountourogianni
Somerville, MA

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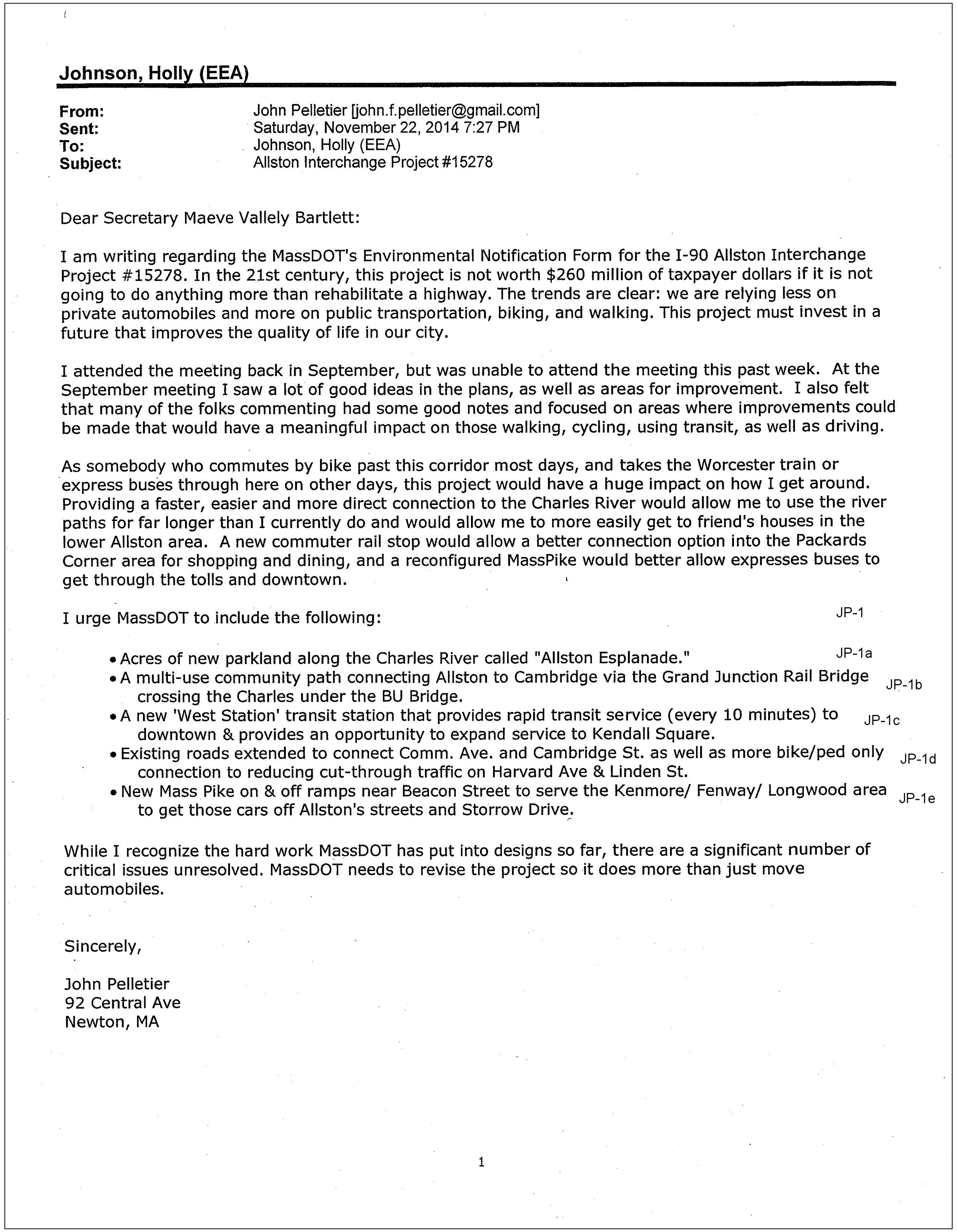


Johnson, Holly (EEA)

From: John Pelletier [john.f.pelletier@gmail.com]
Sent: Saturday, November 22, 2014 7:27 PM
To: Johnson, Holly (EEA)
Subject: Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I attended the meeting back in September, but was unable to attend the meeting this past week. At the September meeting I saw a lot of good ideas in the plans, as well as areas for improvement. I also felt that many of the folks commenting had some good notes and focused on areas where improvements could be made that would have a meaningful impact on those walking, cycling, using transit, as well as driving.

As somebody who commutes by bike past this corridor most days, and takes the Worcester train or express buses through here on other days, this project would have a huge impact on how I get around. Providing a faster, easier and more direct connection to the Charles River would allow me to use the river paths for far longer than I currently do and would allow me to more easily get to friend's houses in the lower Allston area. A new commuter rail stop would allow a better connection option into the Packards Corner area for shopping and dining, and a reconfigured MassPike would better allow expresses buses to get through the tolls and downtown.

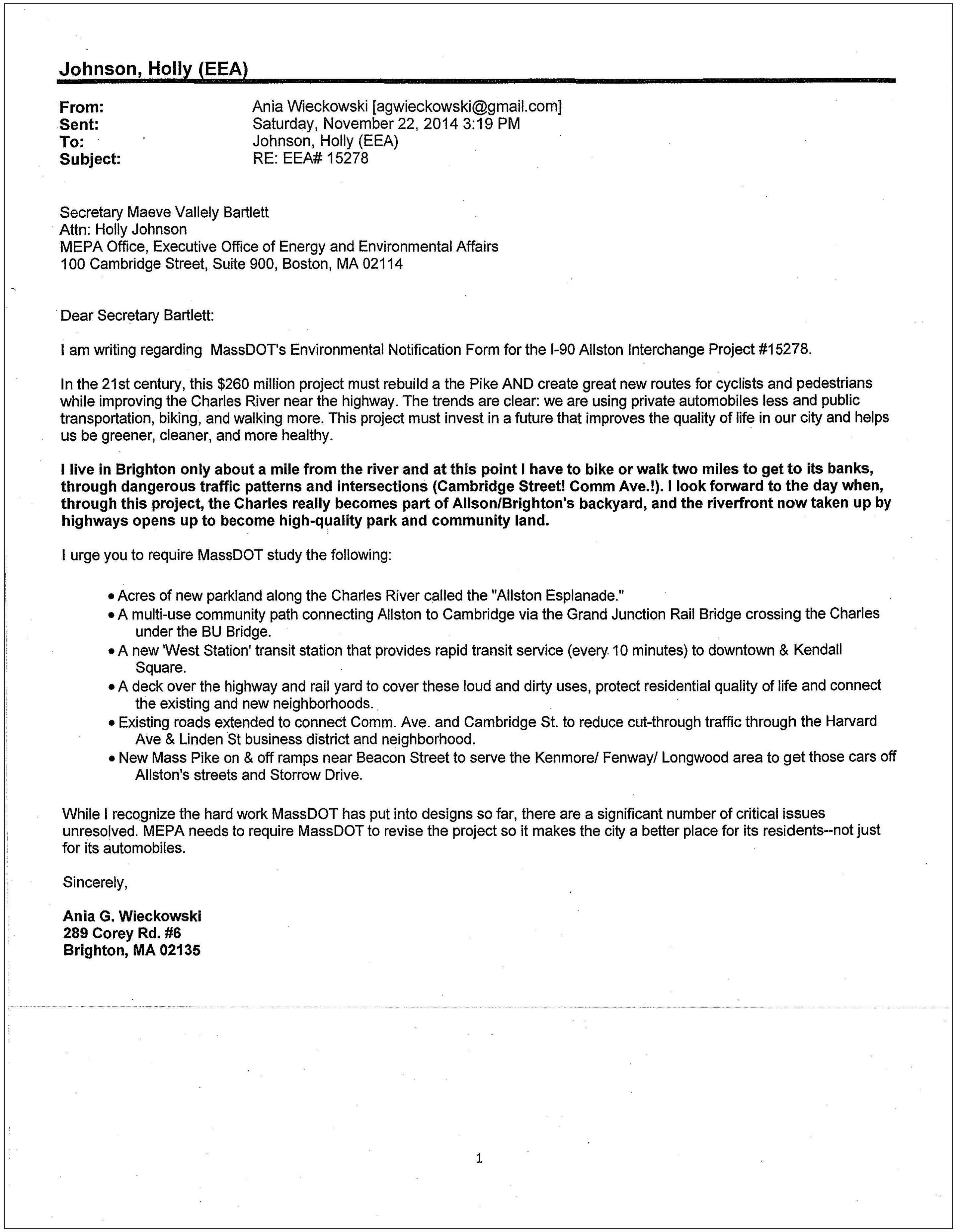
I urge MassDOT to include the following: JP-1

- Acres of new parkland along the Charles River called "Allston Esplanade." JP-1a
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge. JP-1b
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & provides an opportunity to expand service to Kendall Square. JP-1c
- Existing roads extended to connect Comm. Ave. and Cambridge St. as well as more bike/ped only connection to reducing cut-through traffic on Harvard Ave & Linden St. JP-1d
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive. JP-1e

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

John Pelletier
92 Central Ave
Newton, MA



Johnson, Holly (EEA)

From: Ania Wieckowski [agwieckowski@gmail.com]
Sent: Saturday, November 22, 2014 3:19 PM
To: Johnson, Holly (EEA)
Subject: RE: EEA# 15278

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

I live in Brighton only about a mile from the river and at this point I have to bike or walk two miles to get to its banks, through dangerous traffic patterns and intersections (Cambridge Street! Comm Ave.!). I look forward to the day when, through this project, the Charles really becomes part of Allson/Brighton's backyard, and the riverfront now taken up by highways opens up to become high-quality park and community land.

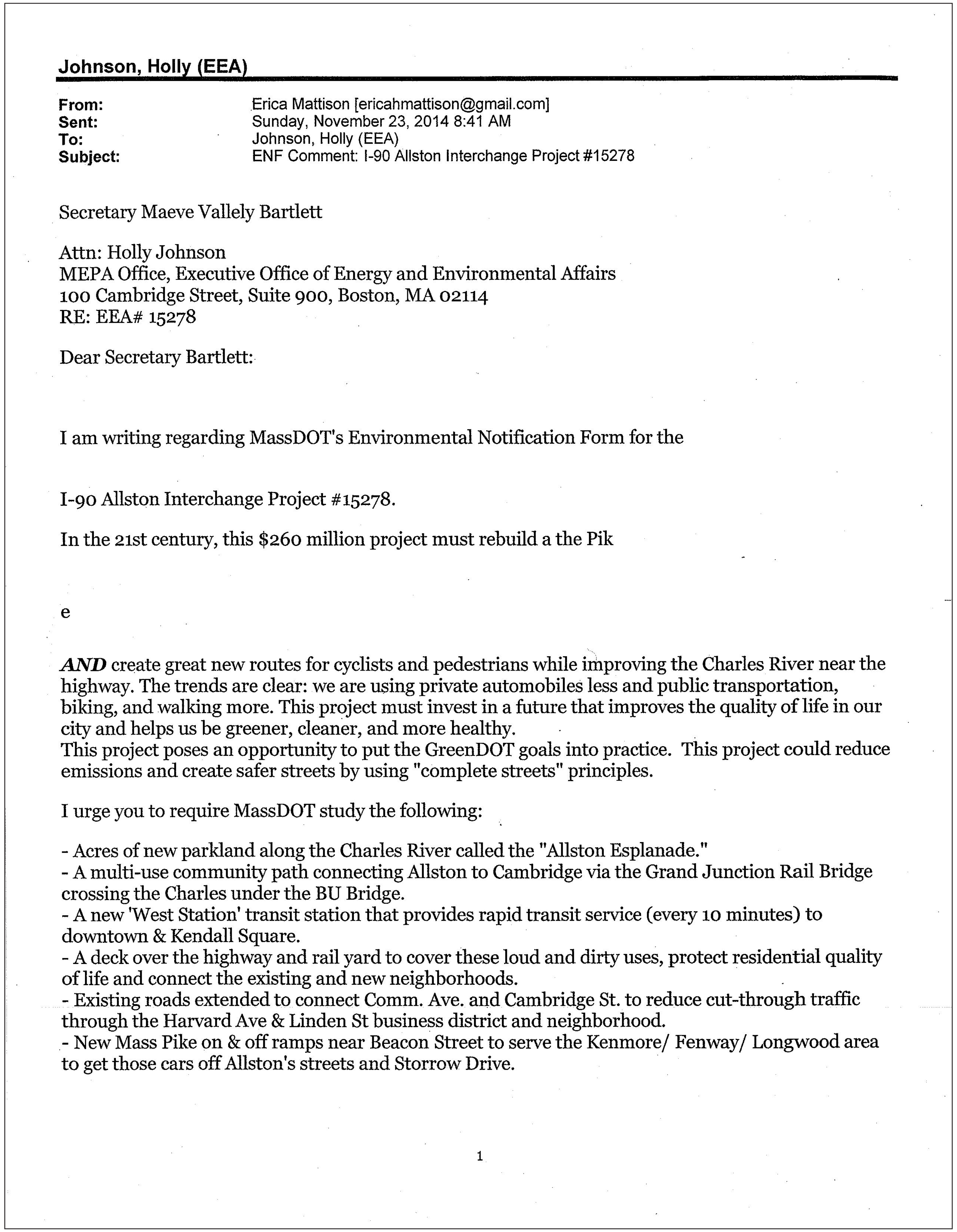
I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it makes the city a better place for its residents--not just for its automobiles.

Sincerely,

Ania G. Wieckowski
289 Corey Rd. #6
Brighton, MA 02135



Johnson, Holly (EEA)

From: Erica Mattison [ericahmattison@gmail.com]
Sent: Sunday, November 23, 2014 8:41 AM
To: Johnson, Holly (EEA)
Subject: ENF Comment: I-90 Allston Interchange Project #15278

Secretary Maeve Vallely Bartlett

Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the

I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pik

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AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.
This project poses an opportunity to put the GreenDOT goals into practice. This project could reduce emissions and create safer streets by using "complete streets" principles.

I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
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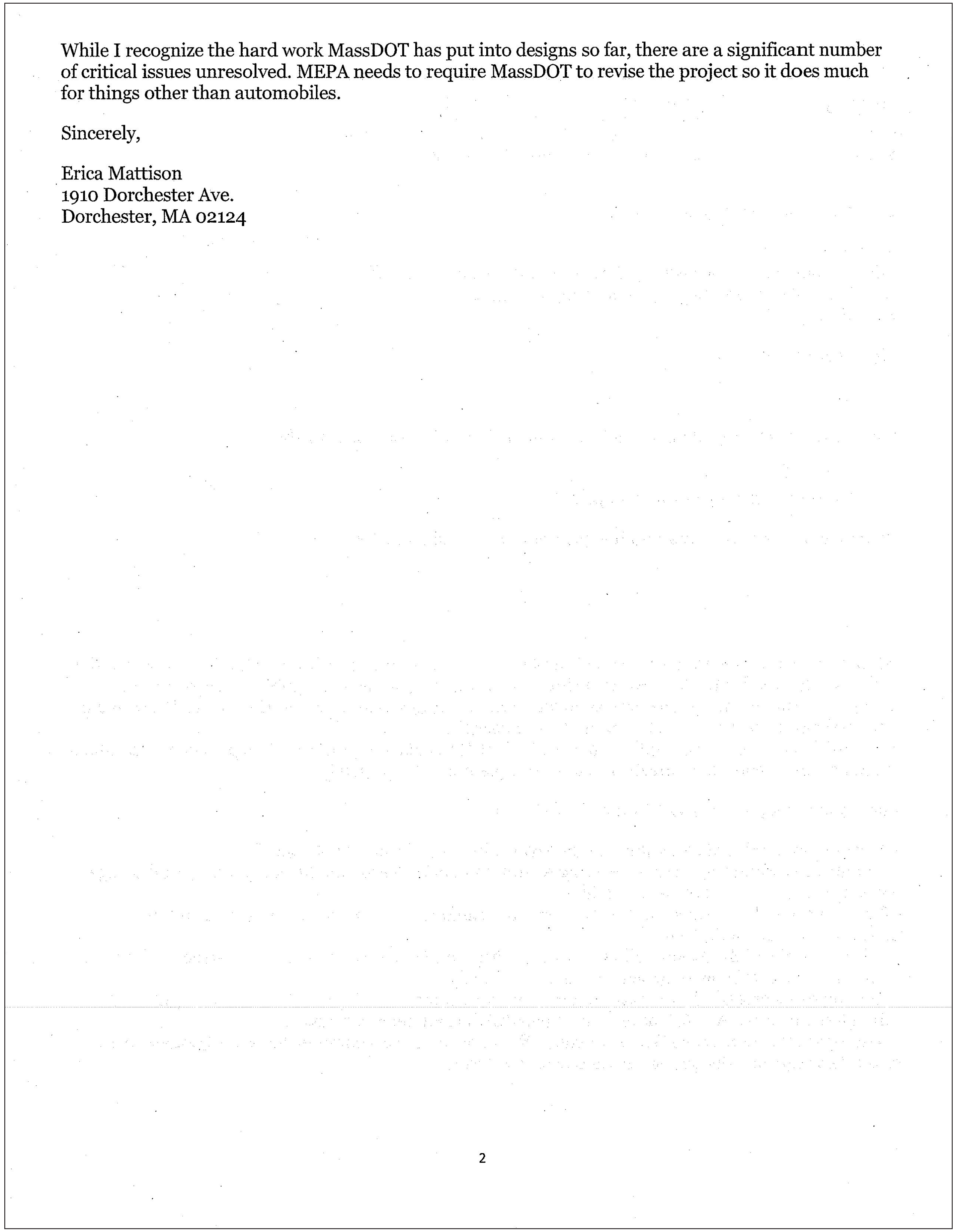
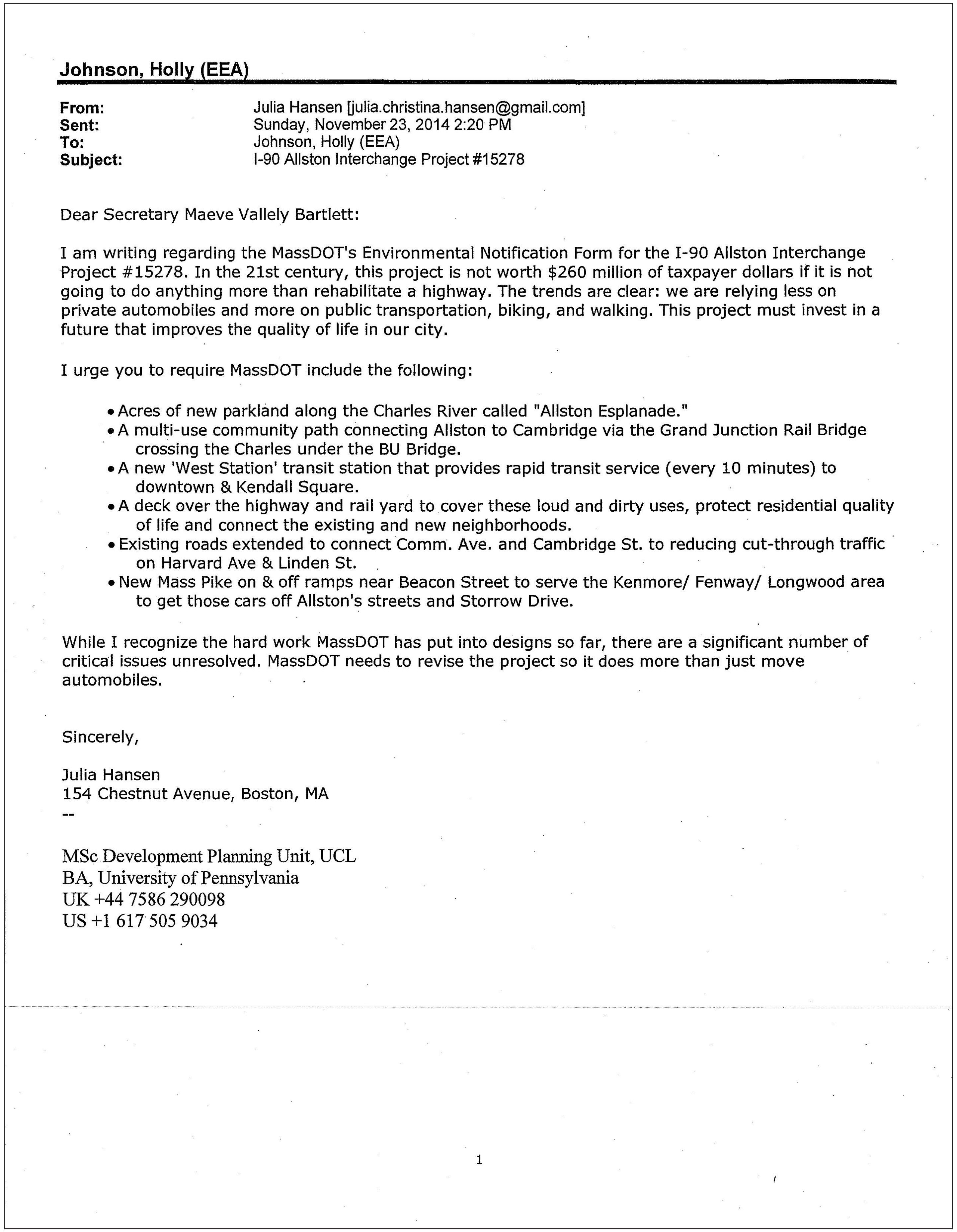


While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,

Erica Mattison
1910 Dorchester Ave.
Dorchester, MA 02124



Johnson, Holly (EEA)

From: Julia Hansen [julia.christina.hansen@gmail.com]
Sent: Sunday, November 23, 2014 2:20 PM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
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- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Julia Hansen
154 Chestnut Avenue, Boston, MA
--

MSc Development Planning Unit, UCL
BA, University of Pennsylvania
UK +44 7586 290098
US +1 617 505 9034

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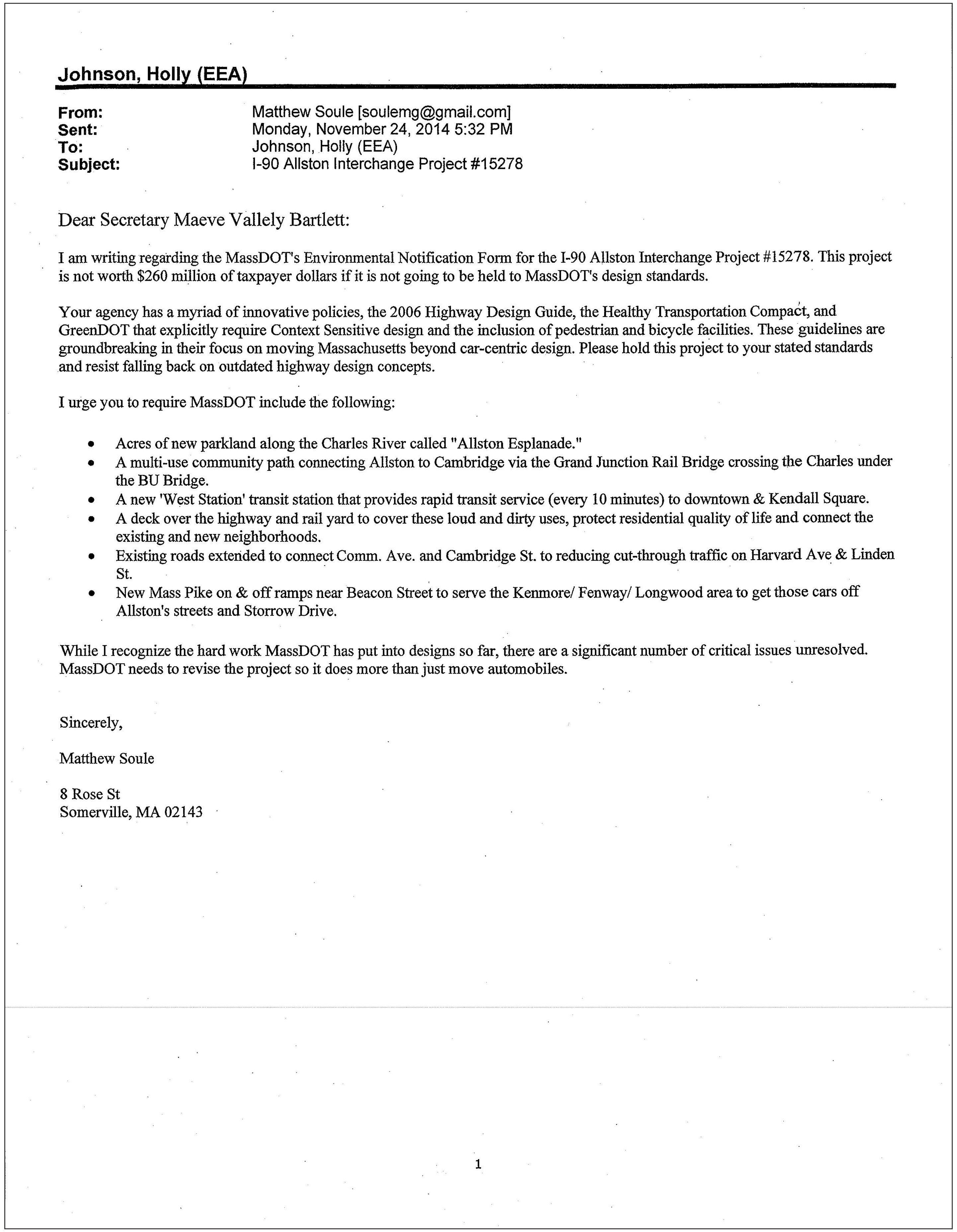

Johnson, Holly (EEA)

From: Matthew Soule [soulemg@gmail.com]
Sent: Monday, November 24, 2014 5:32 PM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. This project is not worth $260 million of taxpayer dollars if it is not going to be held to MassDOT's design standards.

Your agency has a myriad of innovative policies, the 2006 Highway Design Guide, the Healthy Transportation Compact, and GreenDOT that explicitly require Context Sensitive design and the inclusion of pedestrian and bicycle facilities. These guidelines are groundbreaking in their focus on moving Massachusetts beyond car-centric design. Please hold this project to your stated standards and resist falling back on outdated highway design concepts.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Matthew Soule

8 Rose St
Somerville, MA 02143

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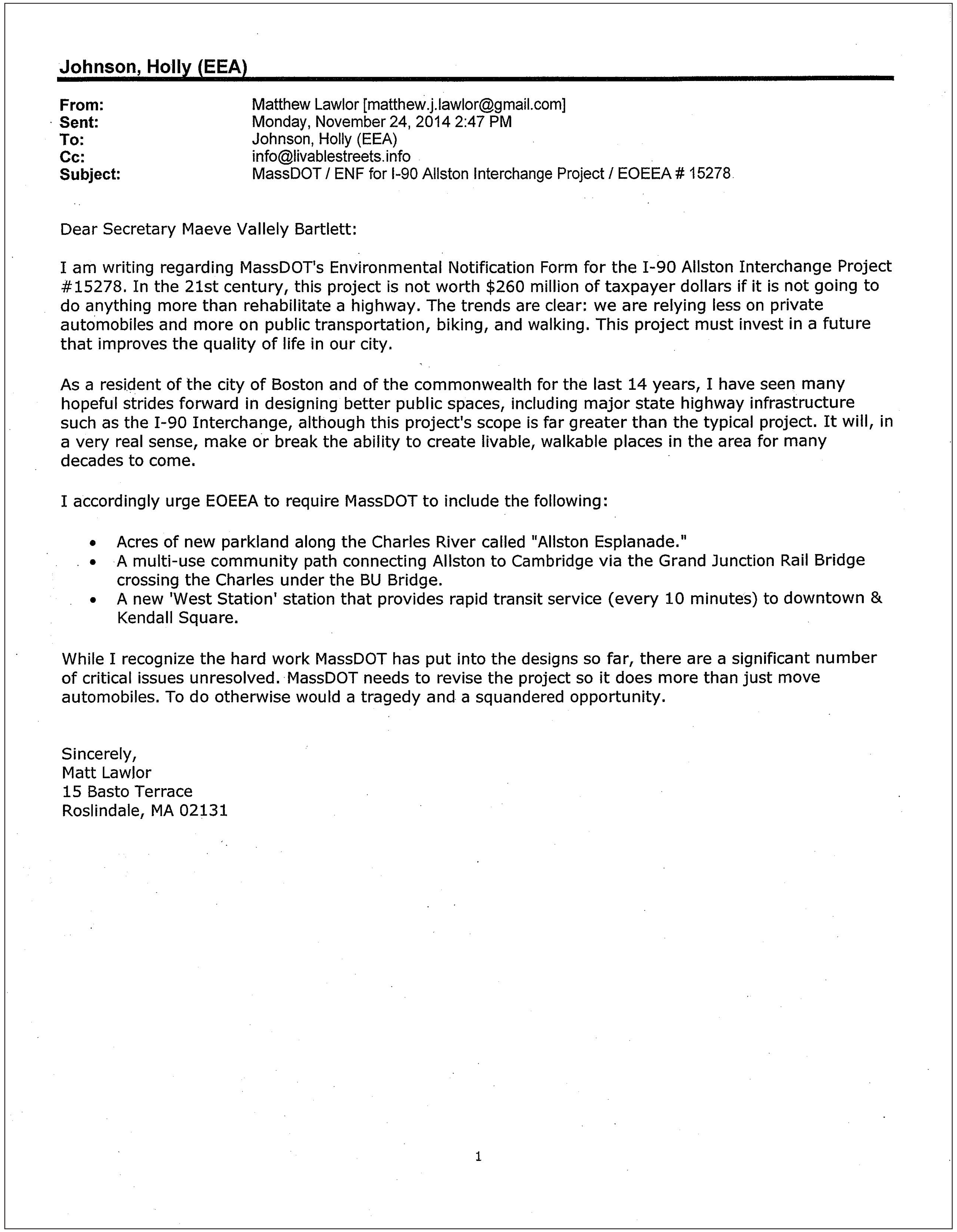


Johnson, Holly (EEA)

From: Matthew Lawlor [matthew.j.lawlor@gmail.com]
Sent: Monday, November 24, 2014 2:47 PM
To: Johnson, Holly (EEA)
Cc: info@livablestreets.info
Subject: MassDOT / ENF for I-90 Allston Interchange Project / EOEEA # 15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

As a resident of the city of Boston and of the commonwealth for the last 14 years, I have seen many hopeful strides forward in designing better public spaces, including major state highway infrastructure such as the I-90 Interchange, although this project's scope is far greater than the typical project. It will, in a very real sense, make or break the ability to create livable, walkable places in the area for many decades to come.

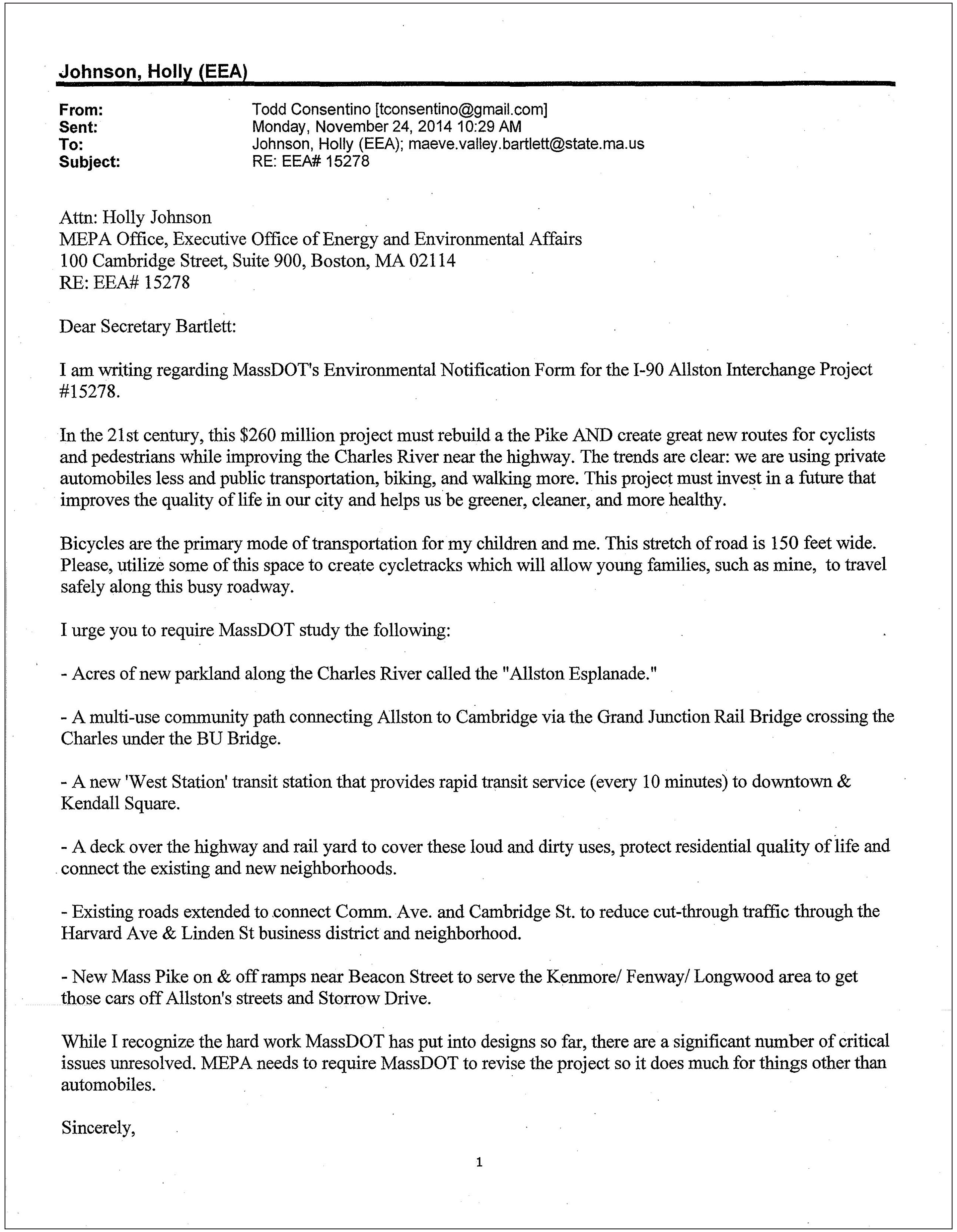
I accordingly urge EOEEA to require MassDOT to include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.

While I recognize the hard work MassDOT has put into the designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles. To do otherwise would a tragedy and a squandered opportunity.

Sincerely,
Matt Lawlor
15 Basto Terrace
Roslindale, MA 02131

1



Johnson, Holly (EEA)

From: Todd Consentino [tconsentino@gmail.com]
Sent: Monday, November 24, 2014 10:29 AM
To: Johnson, Holly (EEA); maeve.valley.bartlett@state.ma.us
Subject: RE: EEA# 15278

Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

Bicycles are the primary mode of transportation for my children and me. This stretch of road is 150 feet wide. Please, utilize some of this space to create cycletracks which will allow young families, such as mine, to travel safely along this busy roadway.

I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."

- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.

- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.

- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.

- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.

- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,

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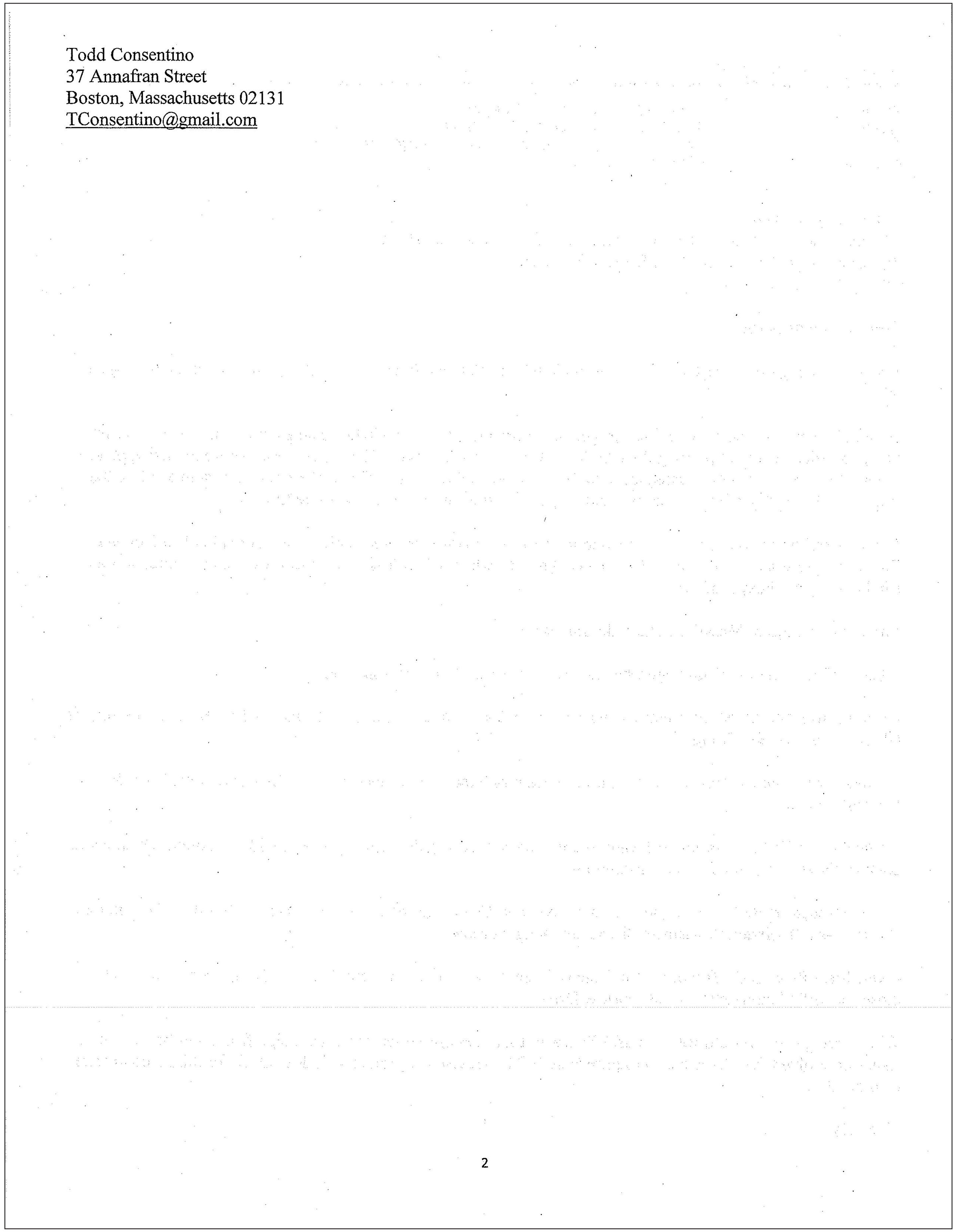
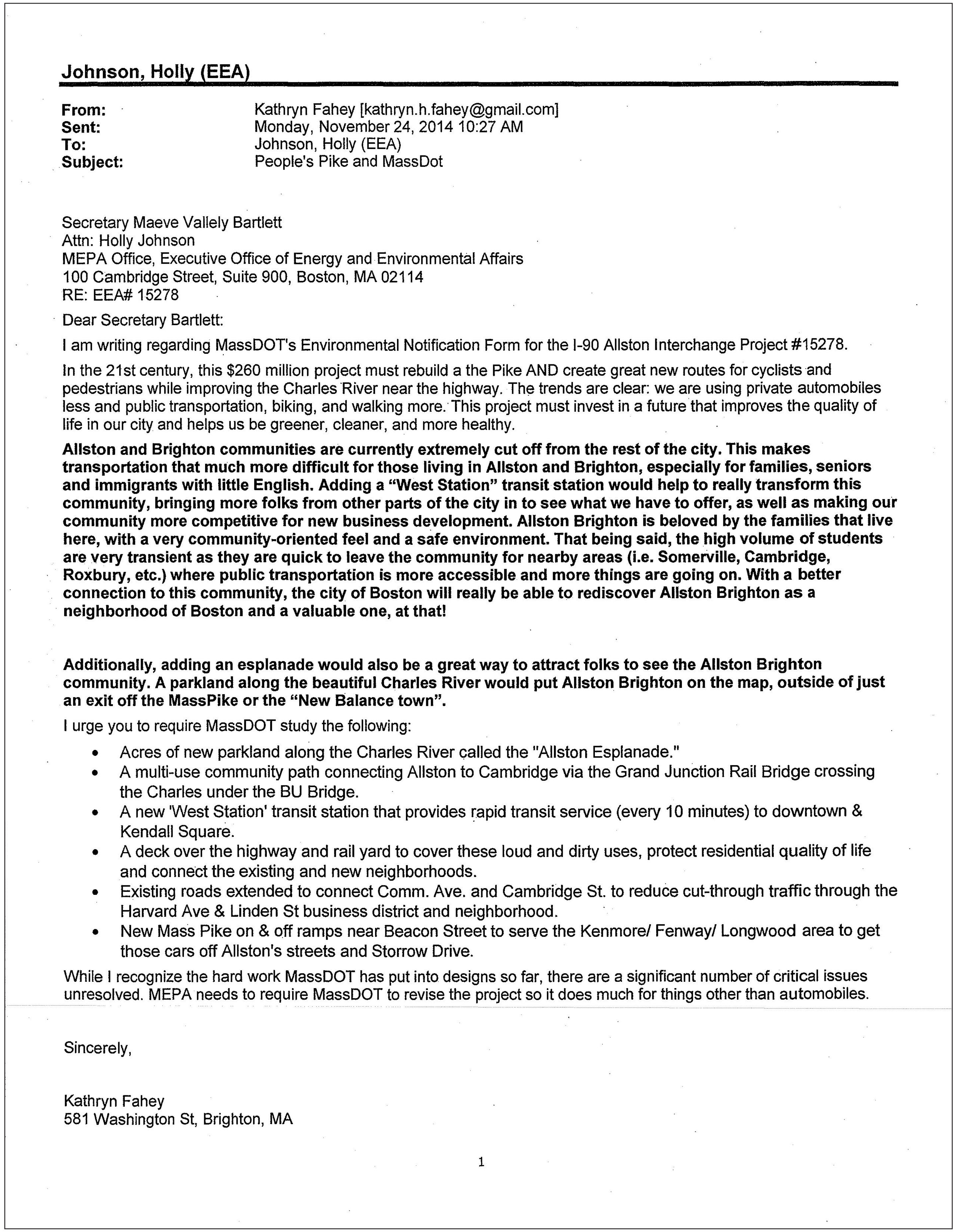


Todd Consentino
37 Annafran Street
Boston, Massachusetts 02131
TConsentino@gmail.com



Johnson, Holly (EEA)

From:	Kathryn Fahey [kathryn.h.fahey@gmail.com]
Sent:	Monday, November 24, 2014 10:27 AM
To:	Johnson, Holly (EEA)
Subject:	People's Pike and MassDot

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

Allston and Brighton communities are currently extremely cut off from the rest of the city. This makes transportation that much more difficult for those living in Allston and Brighton, especially for families, seniors and immigrants with little English. Adding a "West Station" transit station would help to really transform this community, bringing more folks from other parts of the city in to see what we have to offer, as well as making our community more competitive for new business development. Allston Brighton is beloved by the families that live here, with a very community-oriented feel and a safe environment. That being said, the high volume of students are very transient as they are quick to leave the community for nearby areas (i.e. Somerville, Cambridge, Roxbury, etc.) where public transportation is more accessible and more things are going on. With a better connection to this community, the city of Boston will really be able to rediscover Allston Brighton as a neighborhood of Boston and a valuable one, at that!

Additionally, adding an esplanade would also be a great way to attract folks to see the Allston Brighton community. A parkland along the beautiful Charles River would put Allston Brighton on the map, outside of just an exit off the MassPike or the "New Balance town".

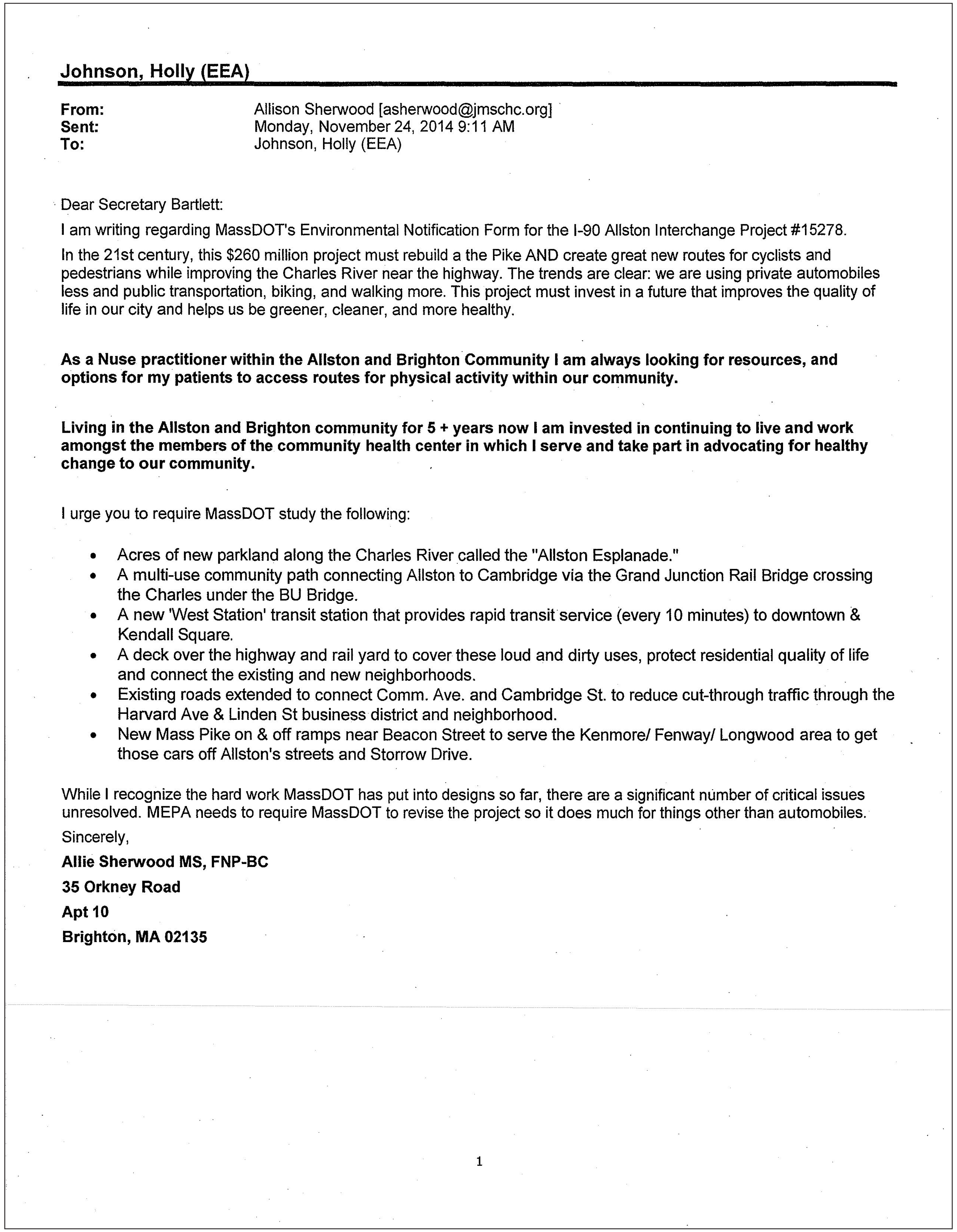
I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,

Kathryn Fahey
581 Washington St, Brighton, MA



Johnson, Holly (EEA)

From: Allison Sherwood [asherwood@jmschc.org]
Sent: Monday, November 24, 2014 9:11 AM
To: Johnson, Holly (EEA)

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

As a Nuse practitioner within the Allston and Brighton Community I am always looking for resources, and options for my patients to access routes for physical activity within our community.

Living in the Allston and Brighton community for 5 + years now I am invested in continuing to live and work amongst the members of the community health center in which I serve and take part in advocating for healthy change to our community.

I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

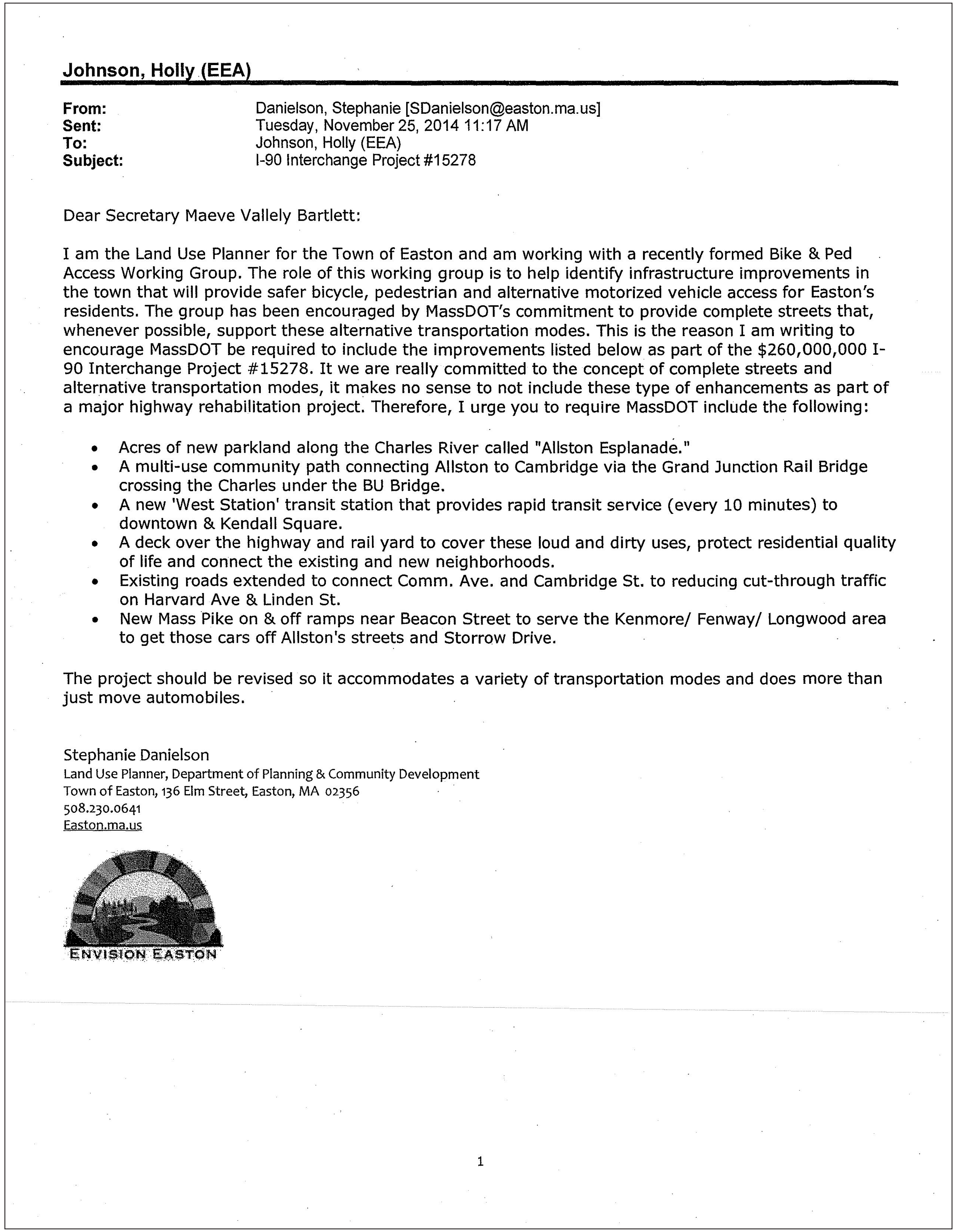
Sincerely,

Allie Sherwood MS, FNP-BC

35 Orkney Road

Apt 10

Brighton, MA 02135



Johnson, Holly (EEA)

From: Danielson, Stephanie [SDanielson@easton.ma.us]
Sent: Tuesday, November 25, 2014 11:17 AM
To: Johnson, Holly (EEA)
Subject: I-90 Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

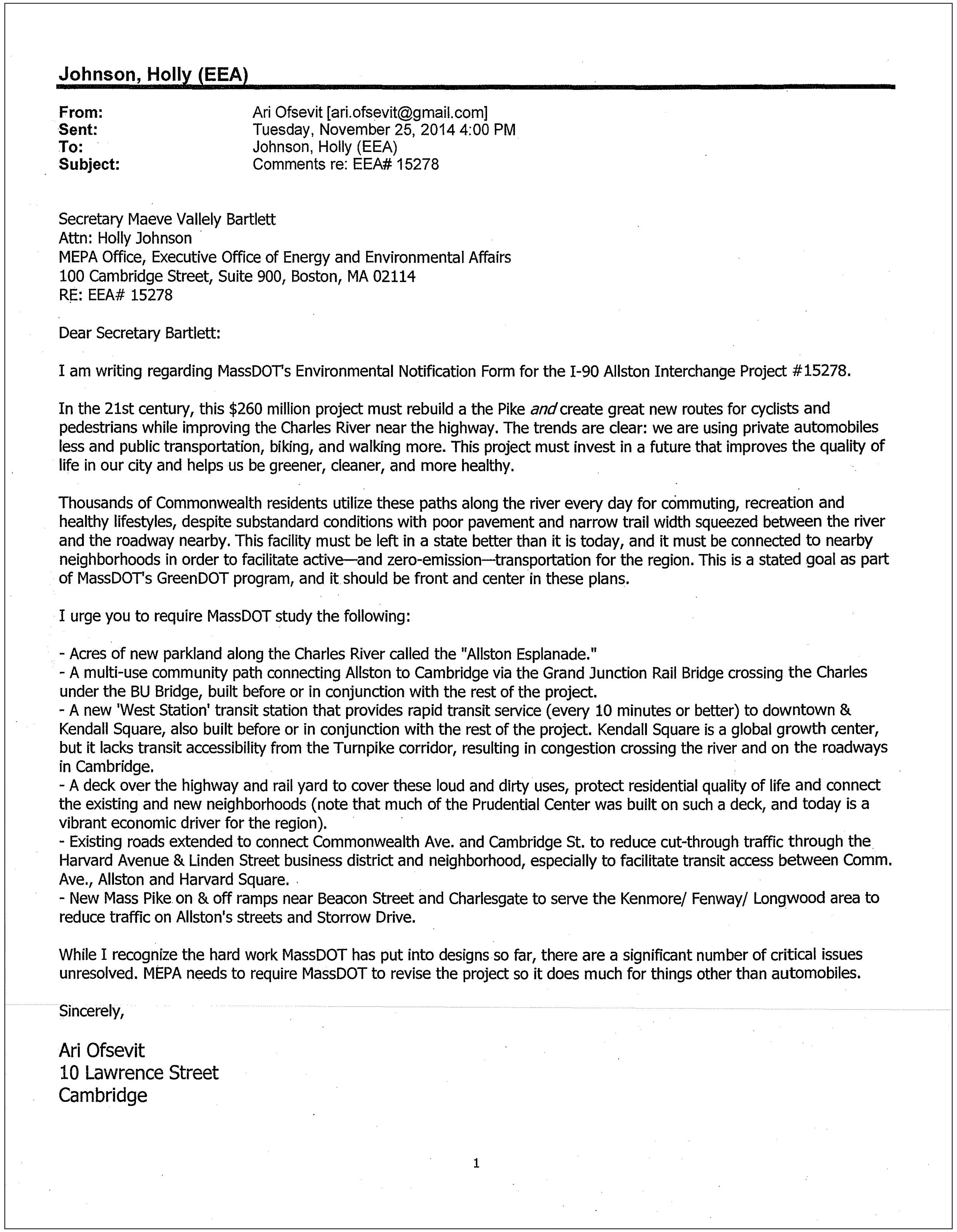
I am the Land Use Planner for the Town of Easton and am working with a recently formed Bike & Ped Access Working Group. The role of this working group is to help identify infrastructure improvements in the town that will provide safer bicycle, pedestrian and alternative motorized vehicle access for Easton's residents. The group has been encouraged by MassDOT's commitment to provide complete streets that, whenever possible, support these alternative transportation modes. This is the reason I am writing to encourage MassDOT be required to include the improvements listed below as part of the $260,000,000 I-90 Interchange Project #15278. It we are really committed to the concept of complete streets and alternative transportation modes, it makes no sense to not include these type of enhancements as part of a major highway rehabilitation project. Therefore, I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

The project should be revised so it accommodates a variety of transportation modes and does more than just move automobiles.

Stephanie Danielson
Land Use Planner, Department of Planning & Community Development
Town of Easton, 136 Elm Street, Easton, MA 02356
508.230.0641
Easton.ma.us

ENVISION EASTON



Johnson, Holly (EEA)

From: Ari Ofsevit [ari.ofsevit@gmail.com]
Sent: Tuesday, November 25, 2014 4:00 PM
To: Johnson, Holly (EEA)
Subject: Comments re: EEA# 15278

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike *and* create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

Thousands of Commonwealth residents utilize these paths along the river every day for commuting, recreation and healthy lifestyles, despite substandard conditions with poor pavement and narrow trail width squeezed between the river and the roadway nearby. This facility must be left in a state better than it is today, and it must be connected to nearby neighborhoods in order to facilitate active—and zero-emission—transportation for the region. This is a stated goal as part of MassDOT's GreenDOT program, and it should be front and center in these plans.

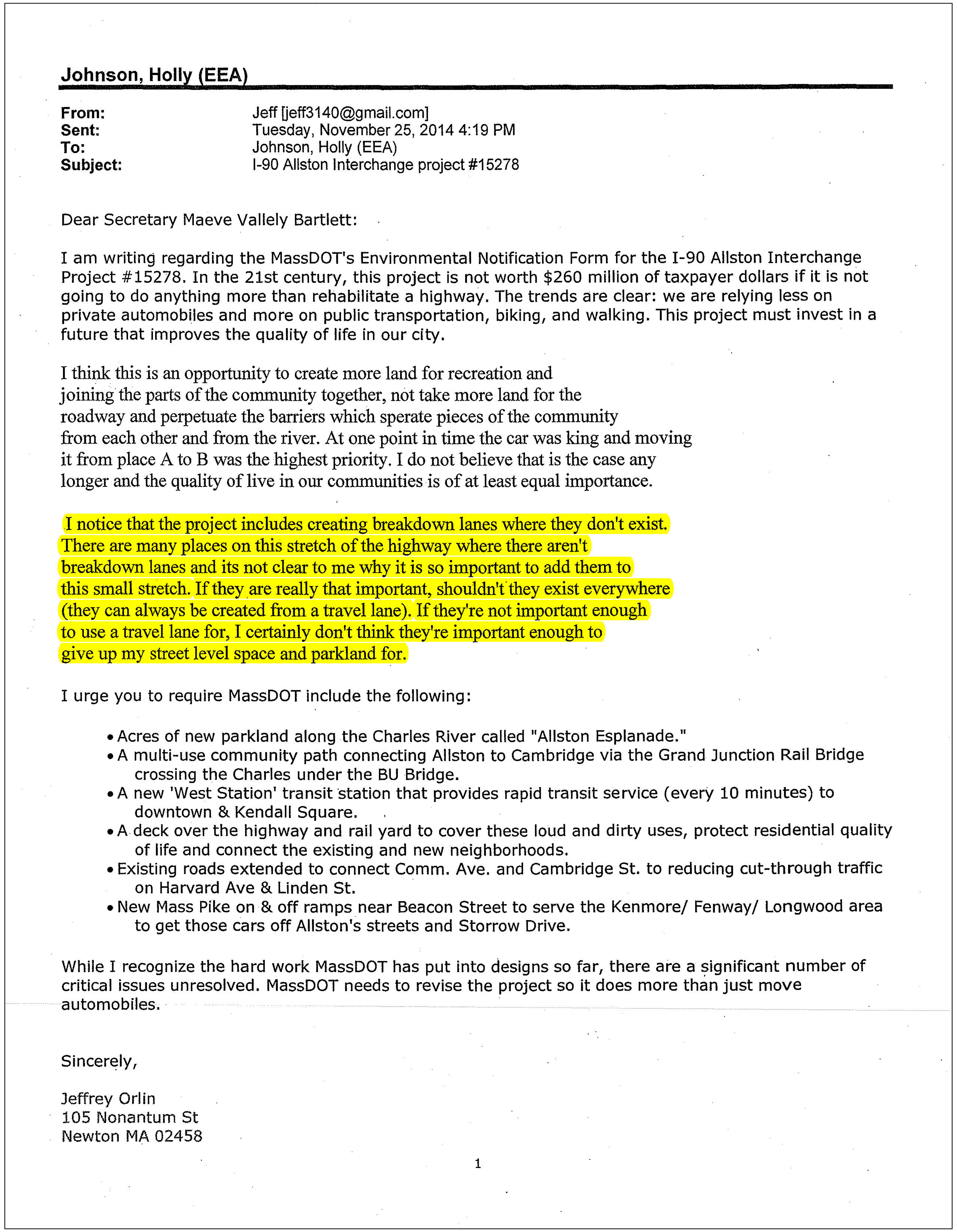
I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge, built before or in conjunction with the rest of the project.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes or better) to downtown & Kendall Square, also built before or in conjunction with the rest of the project. Kendall Square is a global growth center, but it lacks transit accessibility from the Turnpike corridor, resulting in congestion crossing the river and on the roadways in Cambridge.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods (note that much of the Prudential Center was built on such a deck, and today is a vibrant economic driver for the region).
- Existing roads extended to connect Commonwealth Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Avenue & Linden Street business district and neighborhood, especially to facilitate transit access between Comm. Ave., Allston and Harvard Square.
- New Mass Pike on & off ramps near Beacon Street and Charlesgate to serve the Kenmore/ Fenway/ Longwood area to reduce traffic on Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,

Ari Ofsevit
10 Lawrence Street
Cambridge



Johnson, Holly (EEA)

From: Jeff [jeff3140@gmail.com]
Sent: Tuesday, November 25, 2014 4:19 PM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I think this is an opportunity to create more land for recreation and joining the parts of the community together, not take more land for the roadway and perpetuate the barriers which sperate pieces of the community from each other and from the river. At one point in time the car was king and moving it from place A to B was the highest priority. I do not believe that is the case any longer and the quality of live in our communities is of at least equal importance.

I notice that the project includes creating breakdown lanes where they don't exist. There are many places on this stretch of the highway where there aren't breakdown lanes and its not clear to me why it is so important to add them to this small stretch. If they are really that important, shouldn't they exist everywhere (they can always be created from a travel lane). If they're not important enough to use a travel lane for, I certainly don't think they're important enough to give up my street level space and parkland for.

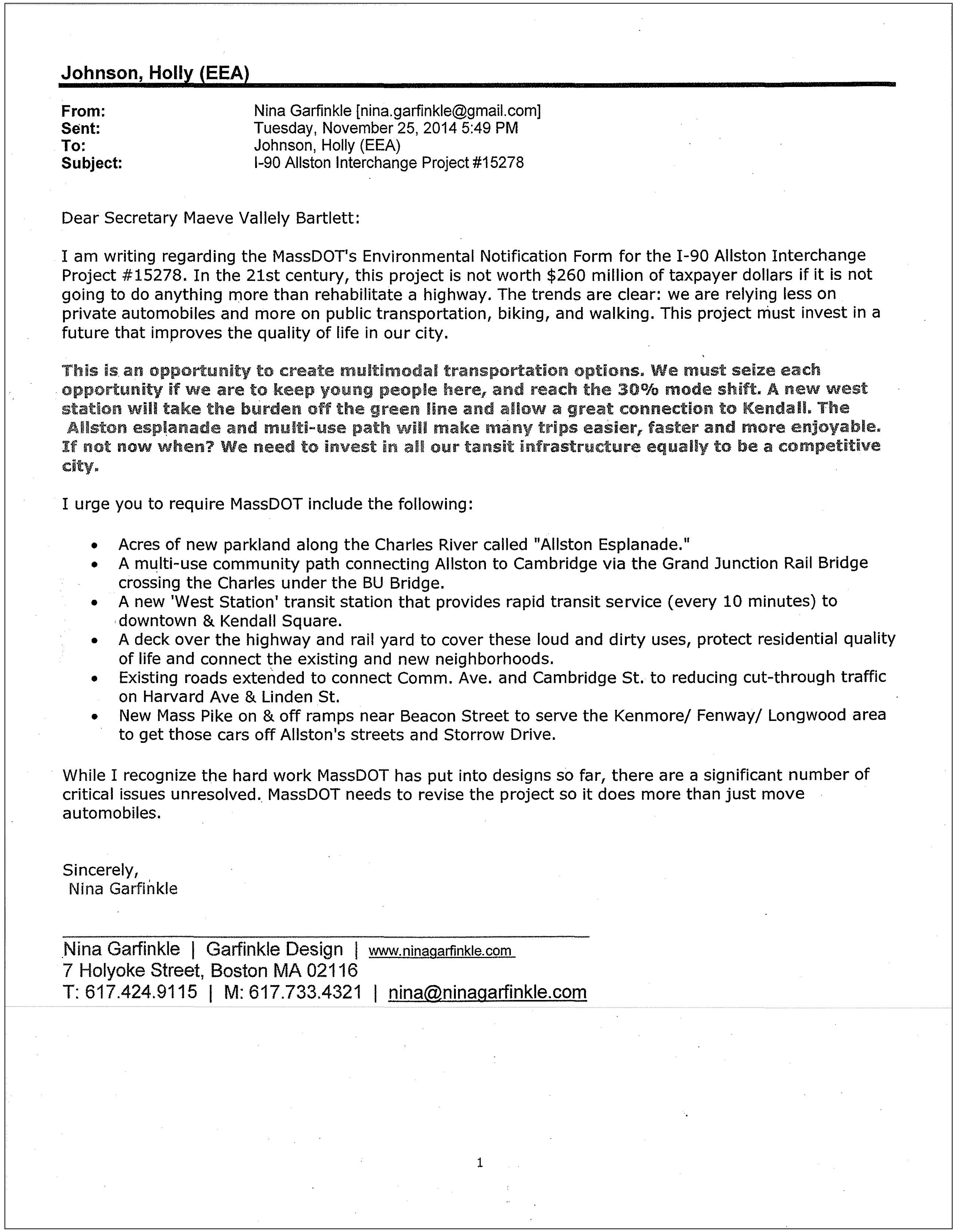
I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,

Jeffrey Orlin
105 Nonantum St
Newton MA 02458



Johnson, Holly (EEA)

From: Nina Garfinkle [nina.garfinkle@gmail.com]
Sent: Tuesday, November 25, 2014 5:49 PM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

This is an opportunity to create multimodal transportation options. We must seize each opportunity if we are to keep young people here, and reach the 30% mode shift. A new west station will take the burden off the green line and allow a great connection to Kendall. The Allston esplanade and multi-use path will make many trips easier, faster and more enjoyable. If not now when? We need to invest in all our tansit infrastructure equally to be a competitive city.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,
Nina Garfinkle

Nina Garfinkle | Garfinkle Design | www.ninagarfinkle.com
7 Holyoke Street, Boston MA 02116
T: 617.424.9115 | M: 617.733.4321 | nina@ninagarfinkle.com

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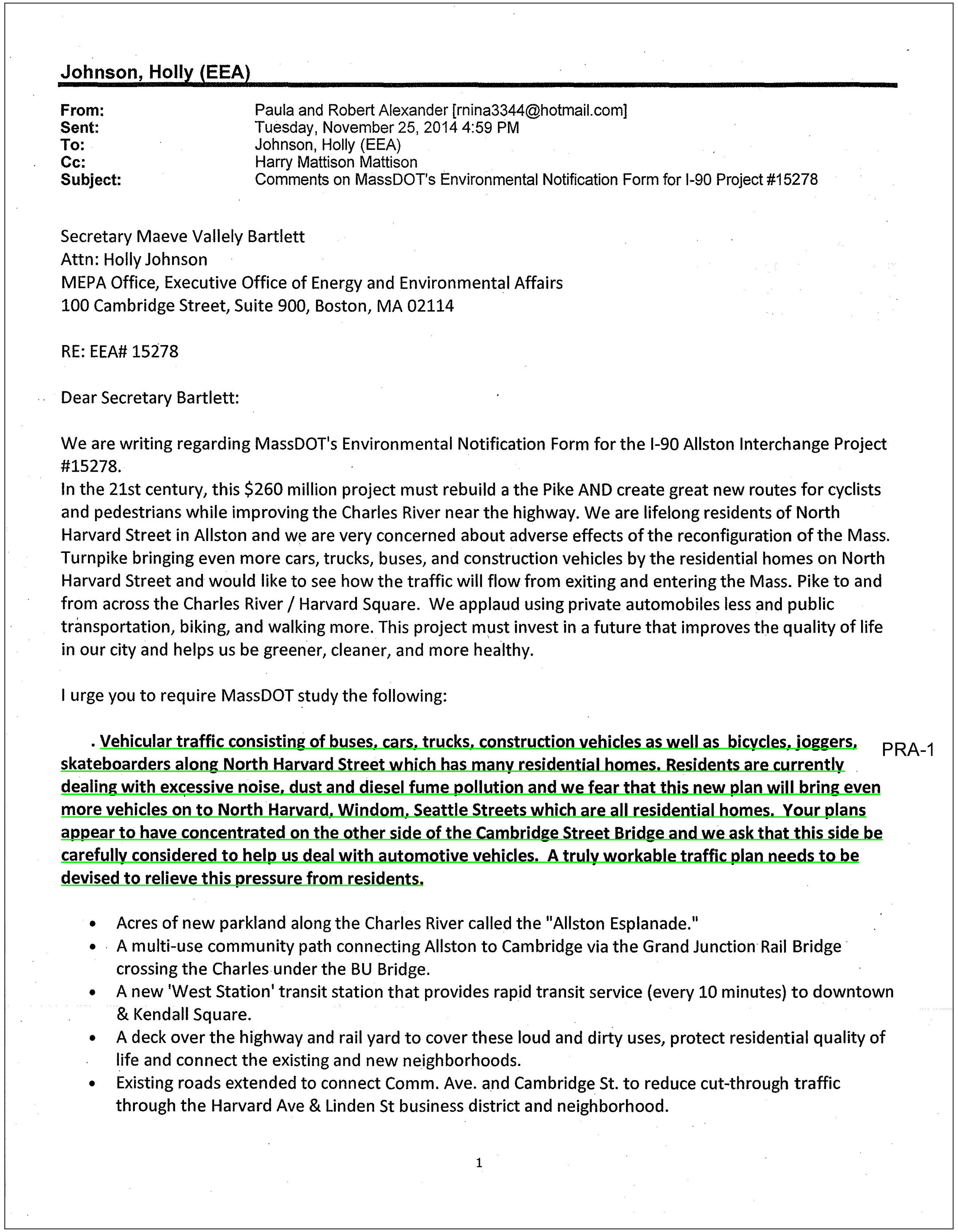

Johnson, Holly (EEA)

From: Paula and Robert Alexander [rnina3344@hotmail.com]
Sent: Tuesday, November 25, 2014 4:59 PM
To: Johnson, Holly (EEA)
Cc: Harry Mattison Mattison
Subject: Comments on MassDOT's Environmental Notification Form for I-90 Project #15278

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114

RE: EEA# 15278

Dear Secretary Bartlett:

We are writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.
In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. We are lifelong residents of North Harvard Street in Allston and we are very concerned about adverse effects of the reconfiguration of the Mass. Turnpike bringing even more cars, trucks, buses, and construction vehicles by the residential homes on North Harvard Street and would like to see how the traffic will flow from exiting and entering the Mass. Pike to and from across the Charles River / Harvard Square. We applaud using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

I urge you to require MassDOT study the following:

. **Vehicular traffic consisting of buses, cars, trucks, construction vehicles as well as bicycles, joggers, skateboarders along North Harvard Street which has many residential homes. Residents are currently dealing with excessive noise, dust and diesel fume pollution and we fear that this new plan will bring even more vehicles on to North Harvard, Windom, Seattle Streets which are all residential homes. Your plans appear to have concentrated on the other side of the Cambridge Street Bridge and we ask that this side be carefully considered to help us deal with automotive vehicles. A truly workable traffic plan needs to be devised to relieve this pressure from residents.** PRA-1

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.

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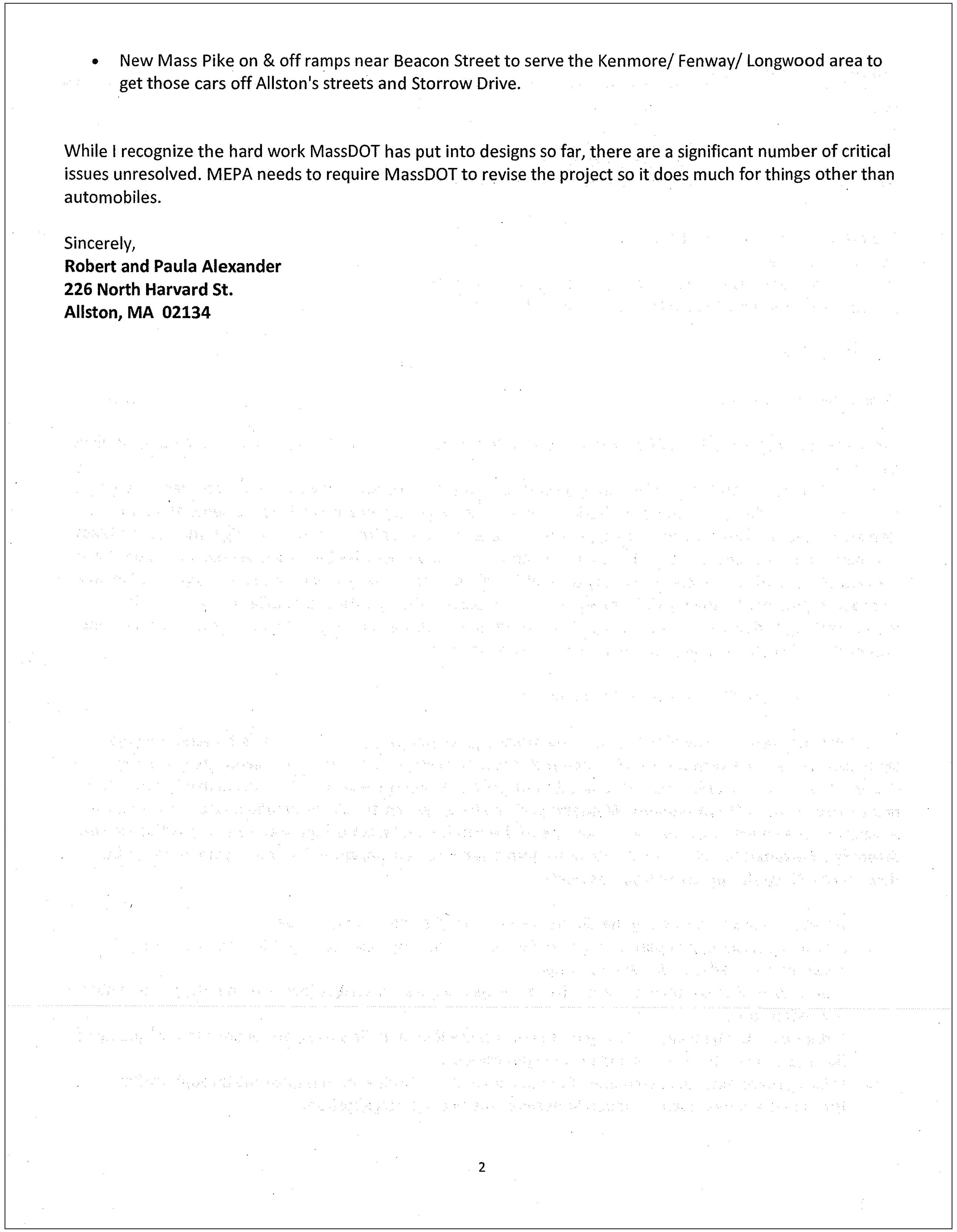
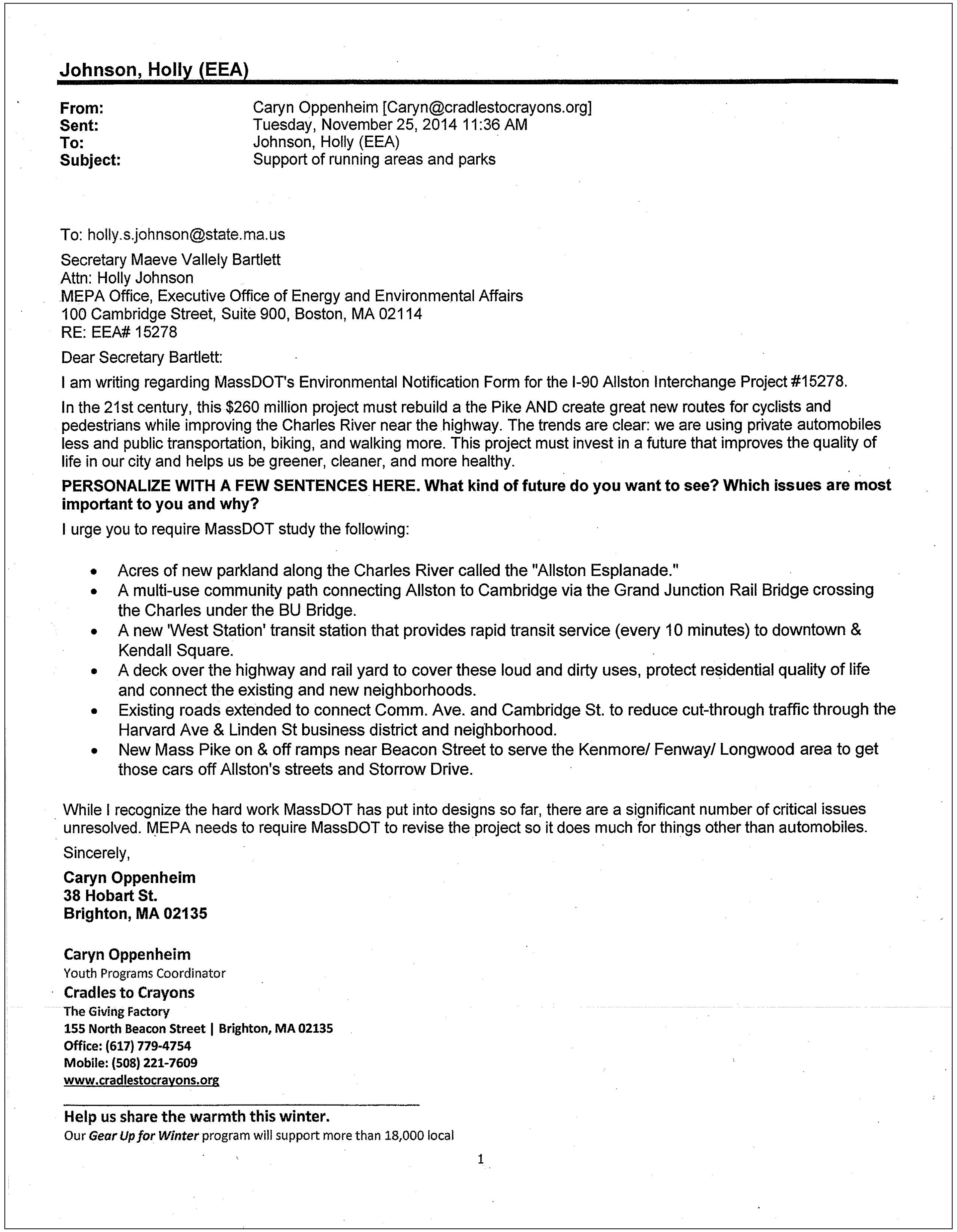


- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,
Robert and Paula Alexander
226 North Harvard St.
Allston, MA 02134



Johnson, Holly (EEA)

From: Caryn Oppenheim [Caryn@cradlestocrayons.org]
Sent: Tuesday, November 25, 2014 11:36 AM
To: Johnson, Holly (EEA)
Subject: Support of running areas and parks

To: holly.s.johnson@state.ma.us

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

PERSONALIZE WITH A FEW SENTENCES HERE. What kind of future do you want to see? Which issues are most important to you and why?

I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,

Caryn Oppenheim
38 Hobart St.
Brighton, MA 02135

Caryn Oppenheim
Youth Programs Coordinator
Cradles to Crayons
The Giving Factory
155 North Beacon Street | Brighton, MA 02135
Office: (617) 779-4754
Mobile: (508) 221-7609
www.cradlestocrayons.org

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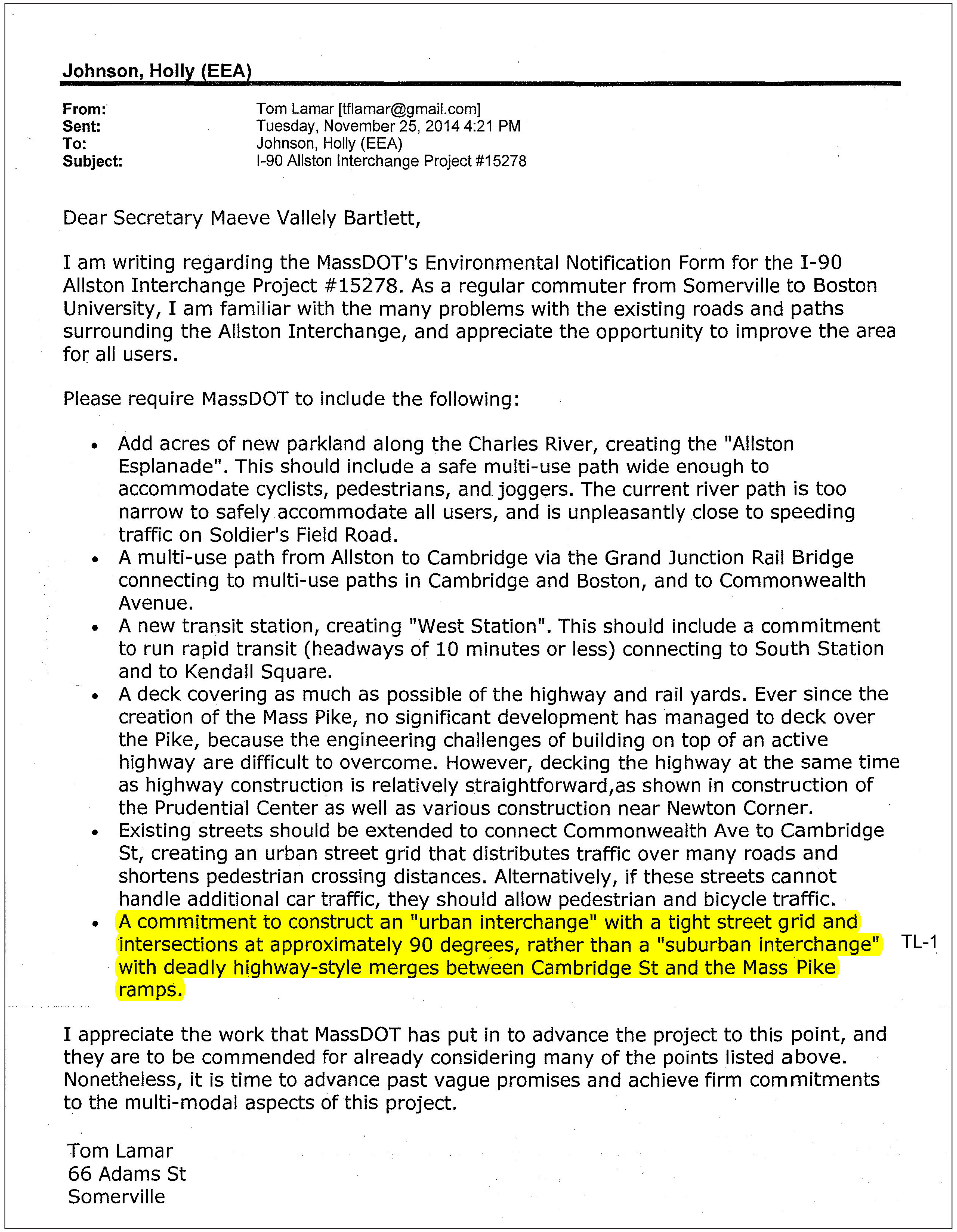


Johnson, Holly (EEA)

From: Tom Lamar [tflamar@gmail.com]
Sent: Tuesday, November 25, 2014 4:21 PM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange Project #15278

Dear Secretary Maeve Vallely Bartlett,

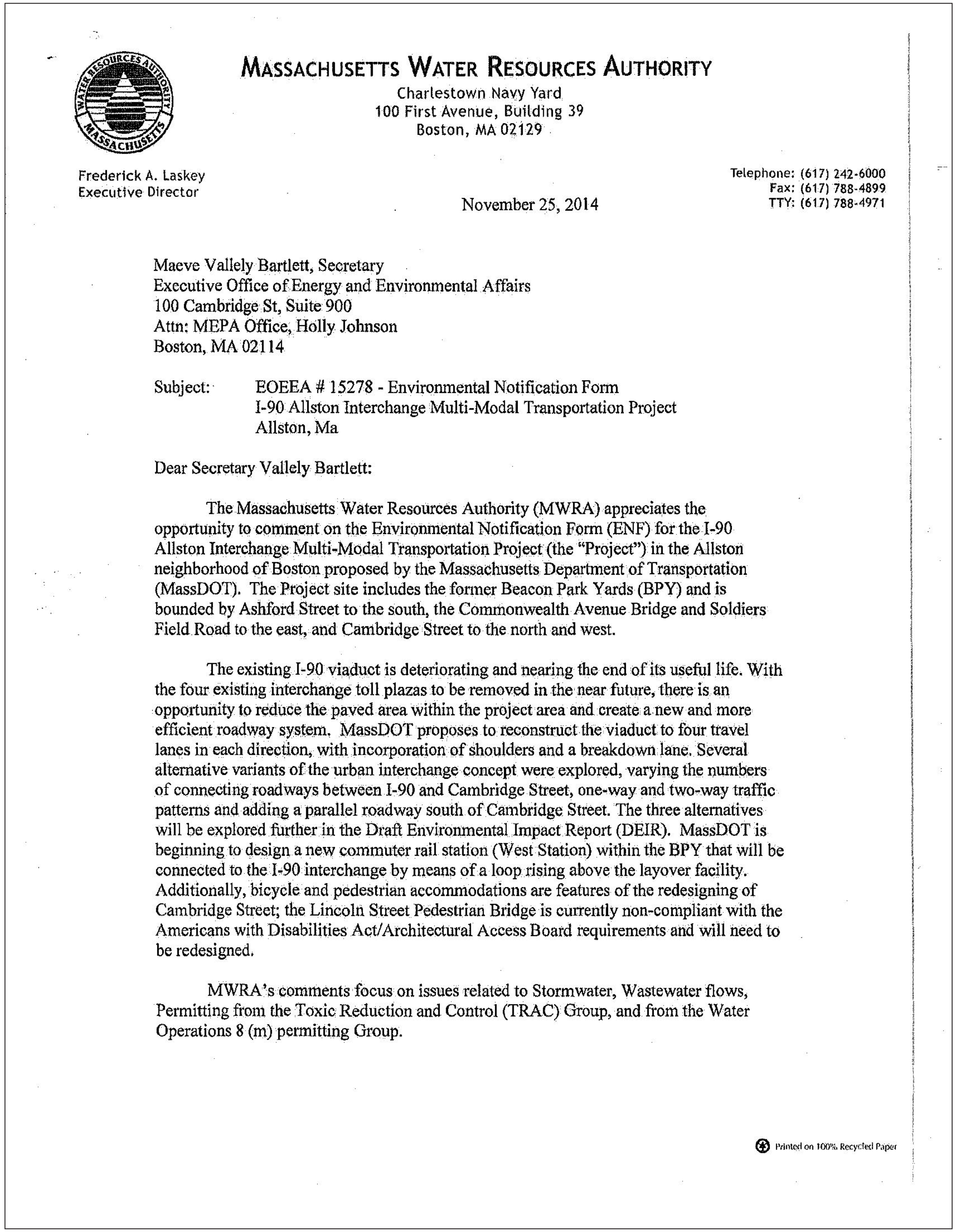
I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. As a regular commuter from Somerville to Boston University, I am familiar with the many problems with the existing roads and paths surrounding the Allston Interchange, and appreciate the opportunity to improve the area for all users.

Please require MassDOT to include the following:

- Add acres of new parkland along the Charles River, creating the "Allston Esplanade". This should include a safe multi-use path wide enough to accommodate cyclists, pedestrians, and joggers. The current river path is too narrow to safely accommodate all users, and is unpleasantly close to speeding traffic on Soldier's Field Road.
- A multi-use path from Allston to Cambridge via the Grand Junction Rail Bridge connecting to multi-use paths in Cambridge and Boston, and to Commonwealth Avenue.
- A new transit station, creating "West Station". This should include a commitment to run rapid transit (headways of 10 minutes or less) connecting to South Station and to Kendall Square.
- A deck covering as much as possible of the highway and rail yards. Ever since the creation of the Mass Pike, no significant development has managed to deck over the Pike, because the engineering challenges of building on top of an active highway are difficult to overcome. However, decking the highway at the same time as highway construction is relatively straightforward,as shown in construction of the Prudential Center as well as various construction near Newton Corner.
- Existing streets should be extended to connect Commonwealth Ave to Cambridge St, creating an urban street grid that distributes traffic over many roads and shortens pedestrian crossing distances. Alternatively, if these streets cannot handle additional car traffic, they should allow pedestrian and bicycle traffic.
- A commitment to construct an "urban interchange" with a tight street grid and intersections at approximately 90 degrees, rather than a "suburban interchange" with deadly highway-style merges between Cambridge St and the Mass Pike ramps. TL-1

I appreciate the work that MassDOT has put in to advance the project to this point, and they are to be commended for already considering many of the points listed above. Nonetheless, it is time to advance past vague promises and achieve firm commitments to the multi-modal aspects of this project.

Tom Lamar
66 Adams St
Somerville



MASSACHUSETTS WATER RESOURCES AUTHORITY
Charlestown Navy Yard
100 First Avenue, Building 39
Boston, MA 02129

Frederick A. Laskey
Executive Director

Telephone: (617) 242-6000
Fax: (617) 788-4899
TTY: (617) 788-4971

November 25, 2014

Maeve Vallely Bartlett, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge St, Suite 900
Attn: MEPA Office, Holly Johnson
Boston, MA 02114

Subject: EOEEA # 15278 - Environmental Notification Form
I-90 Allston Interchange Multi-Modal Transportation Project
Allston, Ma

Dear Secretary Vallely Bartlett:

The Massachusetts Water Resources Authority (MWRA) appreciates the opportunity to comment on the Environmental Notification Form (ENF) for the I-90 Allston Interchange Multi-Modal Transportation Project (the "Project") in the Allston neighborhood of Boston proposed by the Massachusetts Department of Transportation (MassDOT). The Project site includes the former Beacon Park Yards (BPY) and is bounded by Ashford Street to the south, the Commonwealth Avenue Bridge and Soldiers Field Road to the east, and Cambridge Street to the north and west.

The existing I-90 viaduct is deteriorating and nearing the end of its useful life. With the four existing interchange toll plazas to be removed in the near future, there is an opportunity to reduce the paved area within the project area and create a new and more efficient roadway system. MassDOT proposes to reconstruct the viaduct to four travel lanes in each direction, with incorporation of shoulders and a breakdown lane. Several alternative variants of the urban interchange concept were explored, varying the numbers of connecting roadways between I-90 and Cambridge Street, one-way and two-way traffic patterns and adding a parallel roadway south of Cambridge Street. The three alternatives will be explored further in the Draft Environmental Impact Report (DEIR). MassDOT is beginning to design a new commuter rail station (West Station) within the BPY that will be connected to the I-90 interchange by means of a loop rising above the layover facility. Additionally, bicycle and pedestrian accommodations are features of the redesigning of Cambridge Street; the Lincoln Street Pedestrian Bridge is currently non-compliant with the Americans with Disabilities Act/Architectural Access Board requirements and will need to be redesigned.

MWRA's comments focus on issues related to Stormwater, Wastewater flows, Permitting from the Toxic Reduction and Control (TRAC) Group, and from the Water Operations 8 (m) permitting Group.

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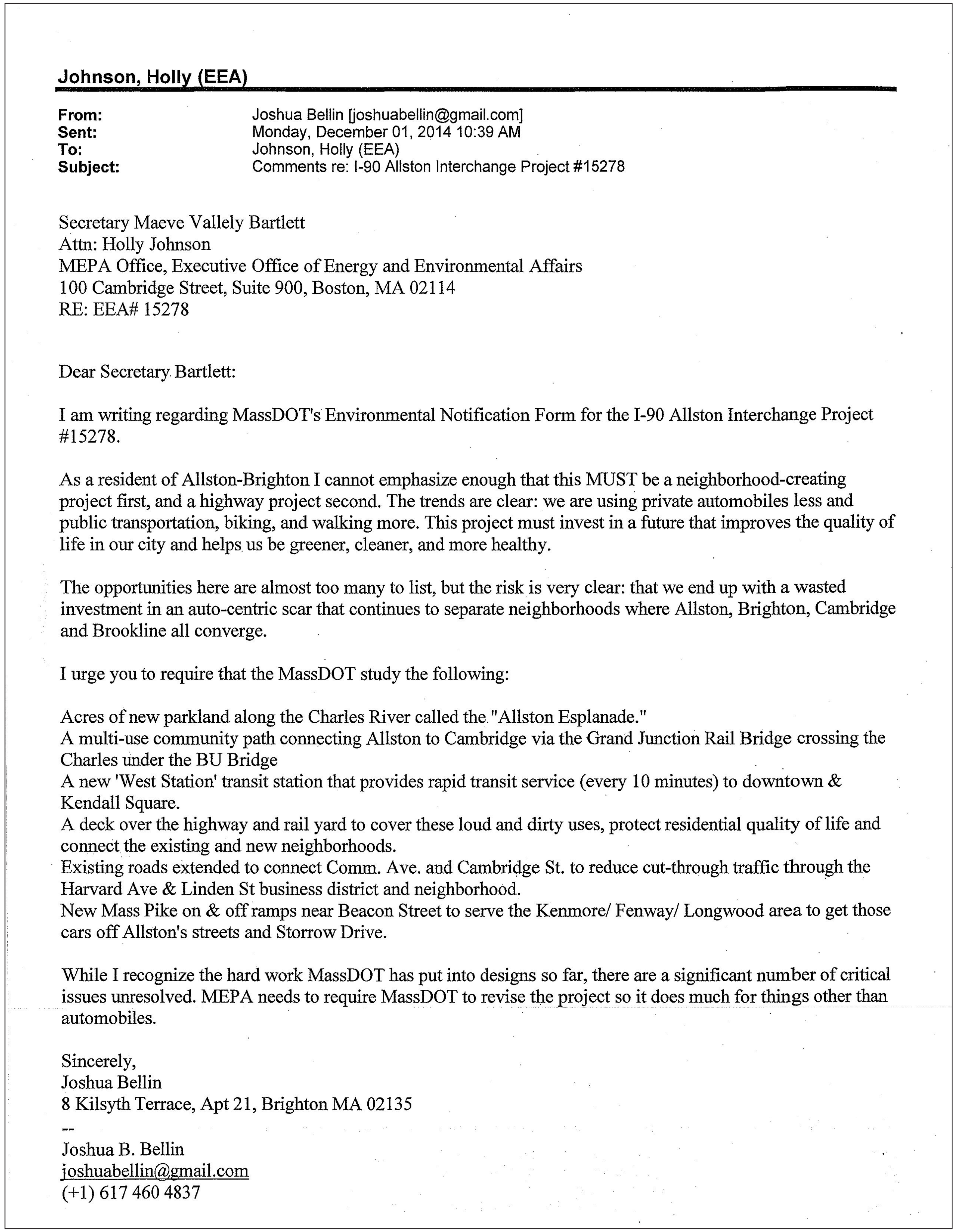


Johnson, Holly (EEA)

From: Joshua Bellin [joshuabellin@gmail.com]
Sent: Monday, December 01, 2014 10:39 AM
To: Johnson, Holly (EEA)
Subject: Comments re: I-90 Allston Interchange Project #15278

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

As a resident of Allston-Brighton I cannot emphasize enough that this MUST be a neighborhood-creating project first, and a highway project second. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

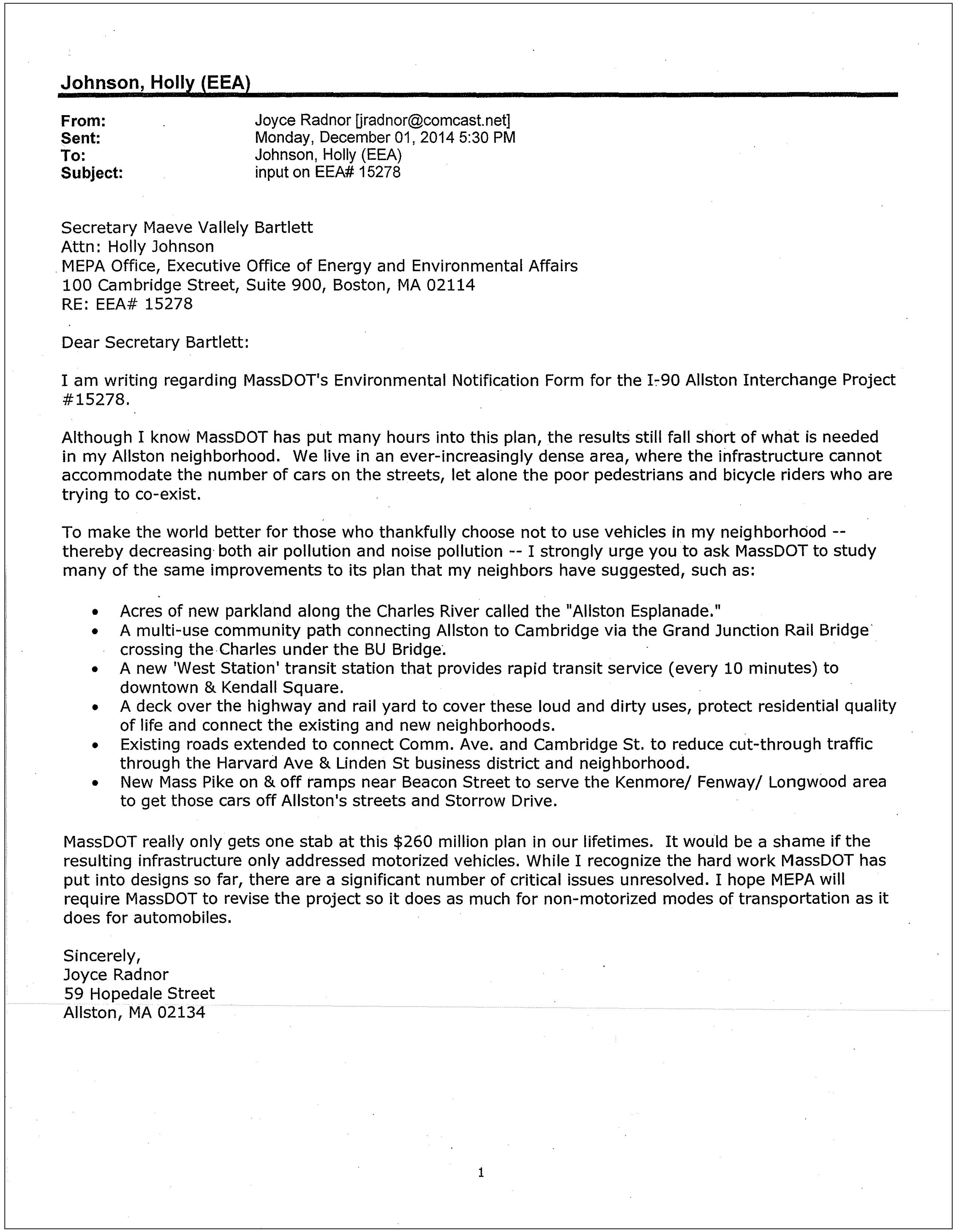
The opportunities here are almost too many to list, but the risk is very clear: that we end up with a wasted investment in an auto-centric scar that continues to separate neighborhoods where Allston, Brighton, Cambridge and Brookline all converge.

I urge you to require that the MassDOT study the following:

Acres of new parkland along the Charles River called the "Allston Esplanade."
A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge
A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,
Joshua Bellin
8 Kilsyth Terrace, Apt 21, Brighton MA 02135
--
Joshua B. Bellin
joshuabellin@gmail.com
(+1) 617 460 4837



Johnson, Holly (EEA)

From: Joyce Radnor [jradnor@comcast.net]
Sent: Monday, December 01, 2014 5:30 PM
To: Johnson, Holly (EEA)
Subject: input on EEA# 15278

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

Although I know MassDOT has put many hours into this plan, the results still fall short of what is needed in my Allston neighborhood. We live in an ever-increasingly dense area, where the infrastructure cannot accommodate the number of cars on the streets, let alone the poor pedestrians and bicycle riders who are trying to co-exist.

To make the world better for those who thankfully choose not to use vehicles in my neighborhood -- thereby decreasing both air pollution and noise pollution -- I strongly urge you to ask MassDOT to study many of the same improvements to its plan that my neighbors have suggested, such as:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

MassDOT really only gets one stab at this $260 million plan in our lifetimes. It would be a shame if the resulting infrastructure only addressed motorized vehicles. While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. I hope MEPA will require MassDOT to revise the project so it does as much for non-motorized modes of transportation as it does for automobiles.

Sincerely,
Joyce Radnor
59 Hopedale Street
Allston, MA 02134

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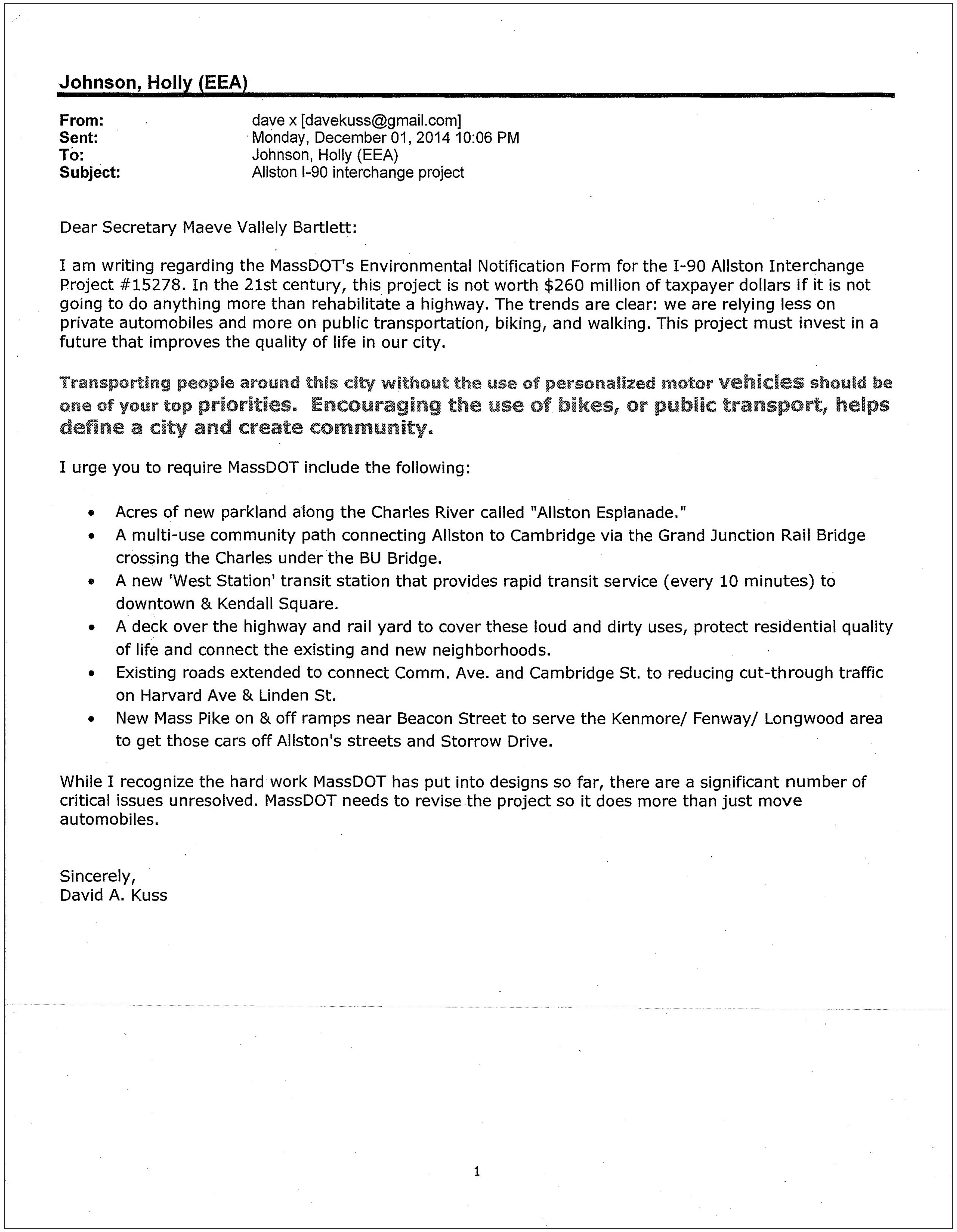


Johnson, Holly (EEA)

From: dave x [davekuss@gmail.com]
Sent: Monday, December 01, 2014 10:06 PM
To: Johnson, Holly (EEA)
Subject: Allston I-90 interchange project

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

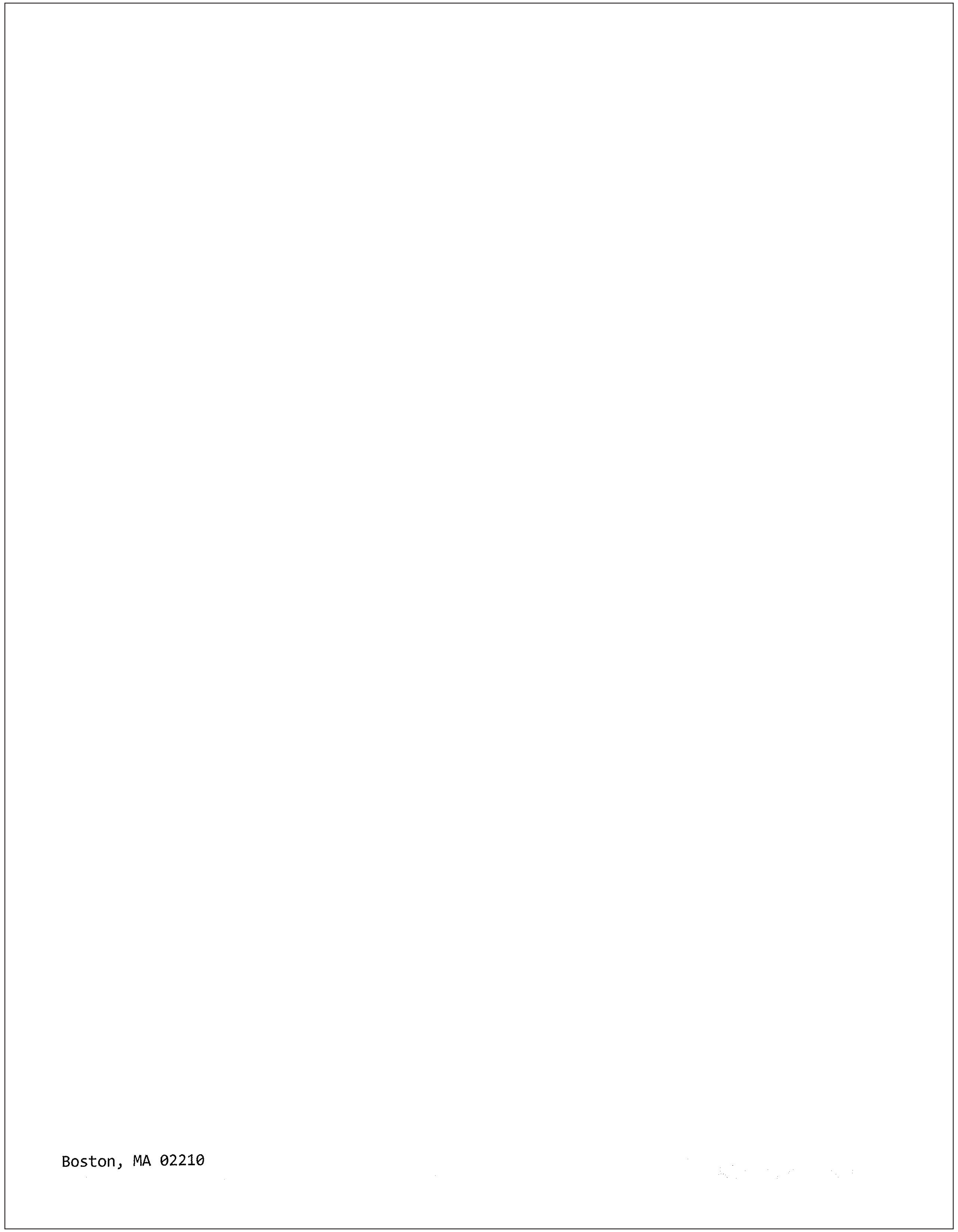
Transporting people around this city without the use of personalized motor vehicles should be one of your top priorities. Encouraging the use of bikes, or public transport, helps define a city and create community.

I urge you to require MassDOT include the following:

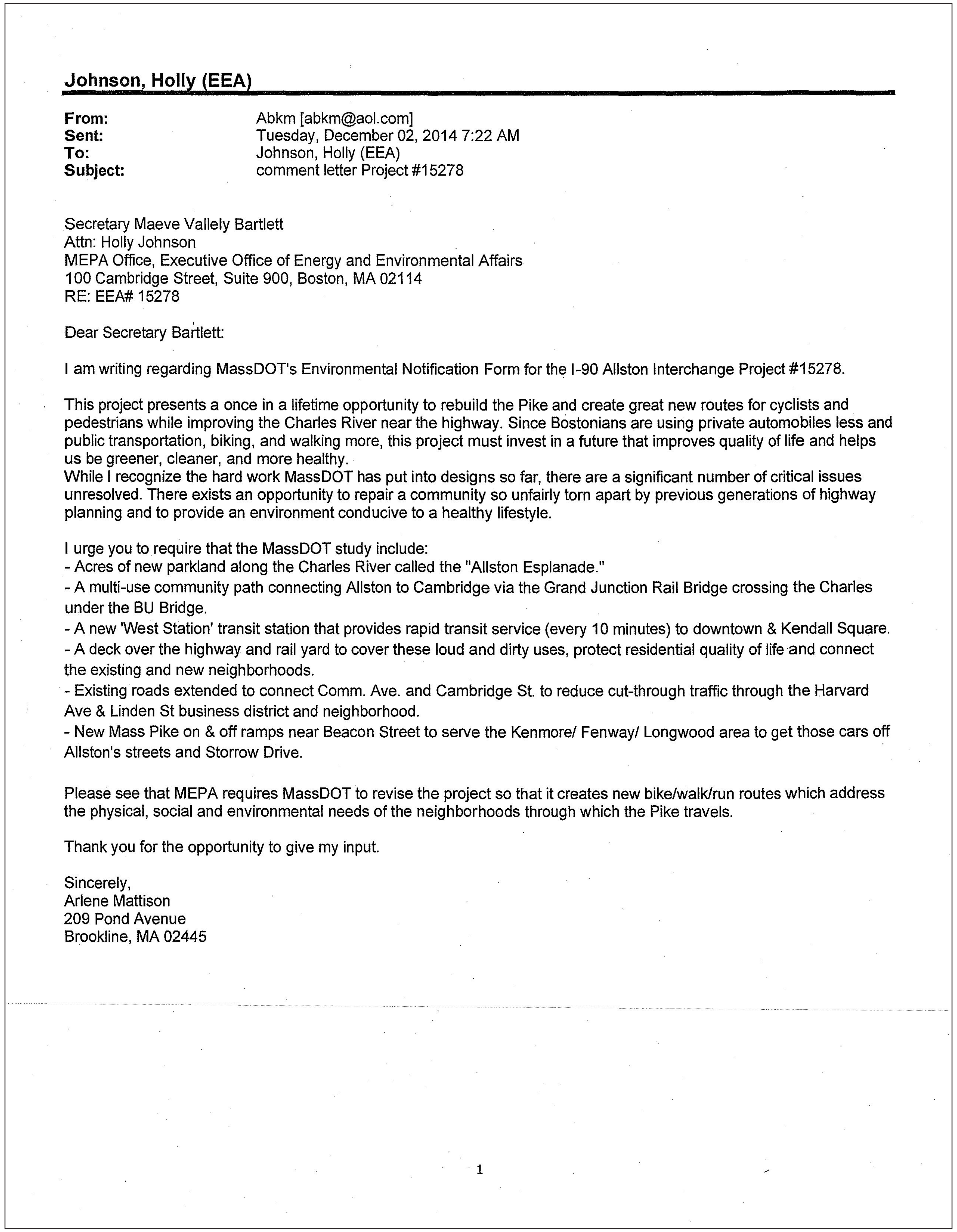
- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,
David A. Kuss



Boston, MA 02210



Johnson, Holly (EEA)

From: Abkm [abkm@aol.com]
Sent: Tuesday, December 02, 2014 7:22 AM
To: Johnson, Holly (EEA)
Subject: comment letter Project #15278

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

This project presents a once in a lifetime opportunity to rebuild the Pike and create great new routes for cyclists and pedestrians while improving the Charles River near the highway. Since Bostonians are using private automobiles less and public transportation, biking, and walking more, this project must invest in a future that improves quality of life and helps us be greener, cleaner, and more healthy.
While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. There exists an opportunity to repair a community so unfairly torn apart by previous generations of highway planning and to provide an environment conducive to a healthy lifestyle.

I urge you to require that the MassDOT study include:
- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

Please see that MEPA requires MassDOT to revise the project so that it creates new bike/walk/run routes which address the physical, social and environmental needs of the neighborhoods through which the Pike travels.

Thank you for the opportunity to give my input.

Sincerely,
Arlene Mattison
209 Pond Avenue
Brookline, MA 02445

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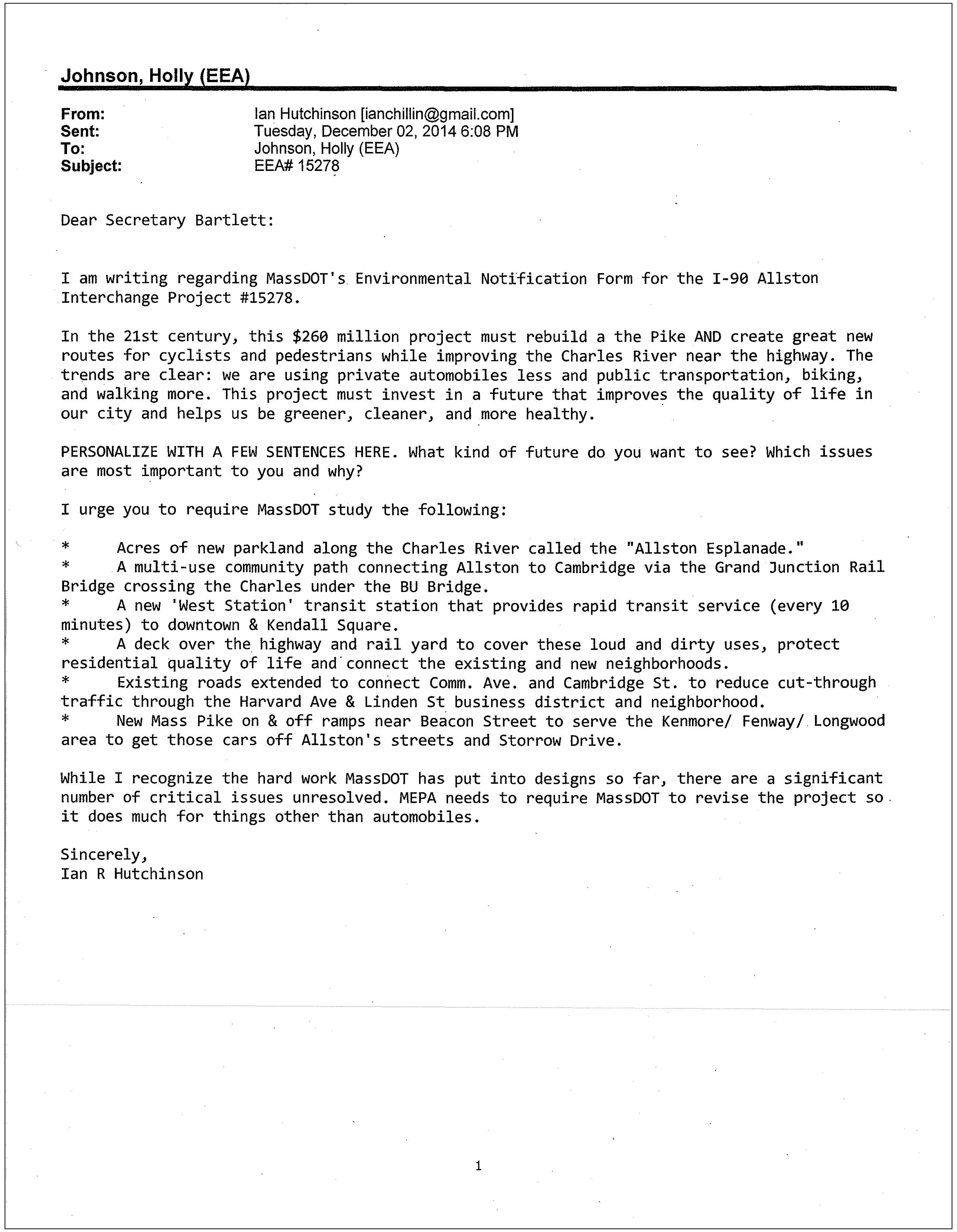

Johnson, Holly (EEA)

From: Ian Hutchinson [ianchillin@gmail.com]
Sent: Tuesday, December 02, 2014 6:08 PM
To: Johnson, Holly (EEA)
Subject: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

PERSONALIZE WITH A FEW SENTENCES HERE. What kind of future do you want to see? Which issues are most important to you and why?

I urge you to require MassDOT study the following:

*   Acres of new parkland along the Charles River called the "Allston Esplanade."
*   A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
*   A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
*   A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
*   Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
*   New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,
Ian R Hutchinson

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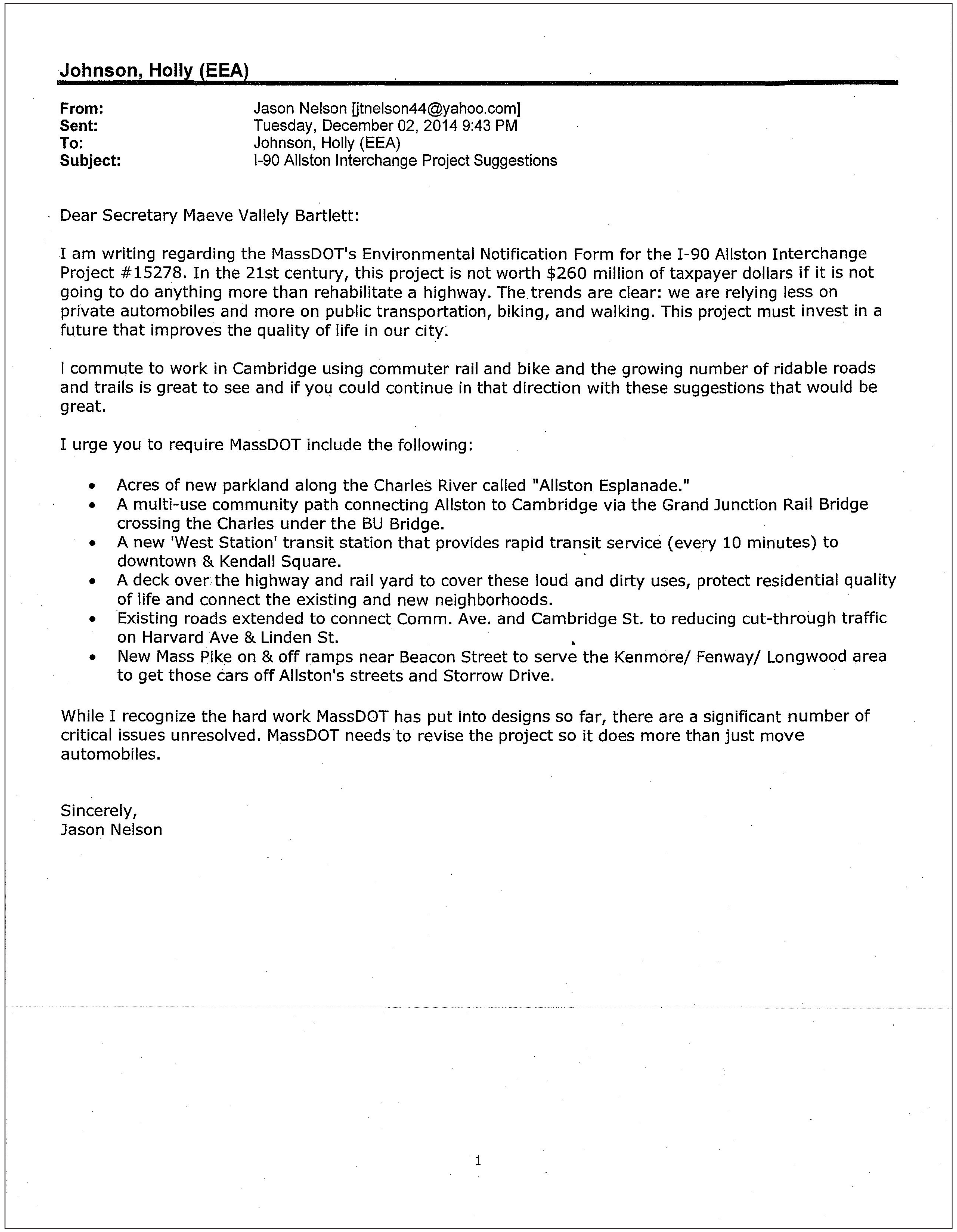

Johnson, Holly (EEA)

From: Jason Nelson [jtnelson44@yahoo.com]
Sent: Tuesday, December 02, 2014 9:43 PM
To: Johnson, Holly (EEA)
Subject: I-90 Allston Interchange Project Suggestions

Dear Secretary Maeve Vallely Bartlett:

I am writing regarding the MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278. In the 21st century, this project is not worth $260 million of taxpayer dollars if it is not going to do anything more than rehabilitate a highway. The trends are clear: we are relying less on private automobiles and more on public transportation, biking, and walking. This project must invest in a future that improves the quality of life in our city.

I commute to work in Cambridge using commuter rail and bike and the growing number of ridable roads and trails is great to see and if you could continue in that direction with these suggestions that would be great.

I urge you to require MassDOT include the following:

- Acres of new parkland along the Charles River called "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reducing cut-through traffic on Harvard Ave & Linden St.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MassDOT needs to revise the project so it does more than just move automobiles.

Sincerely,
Jason Nelson

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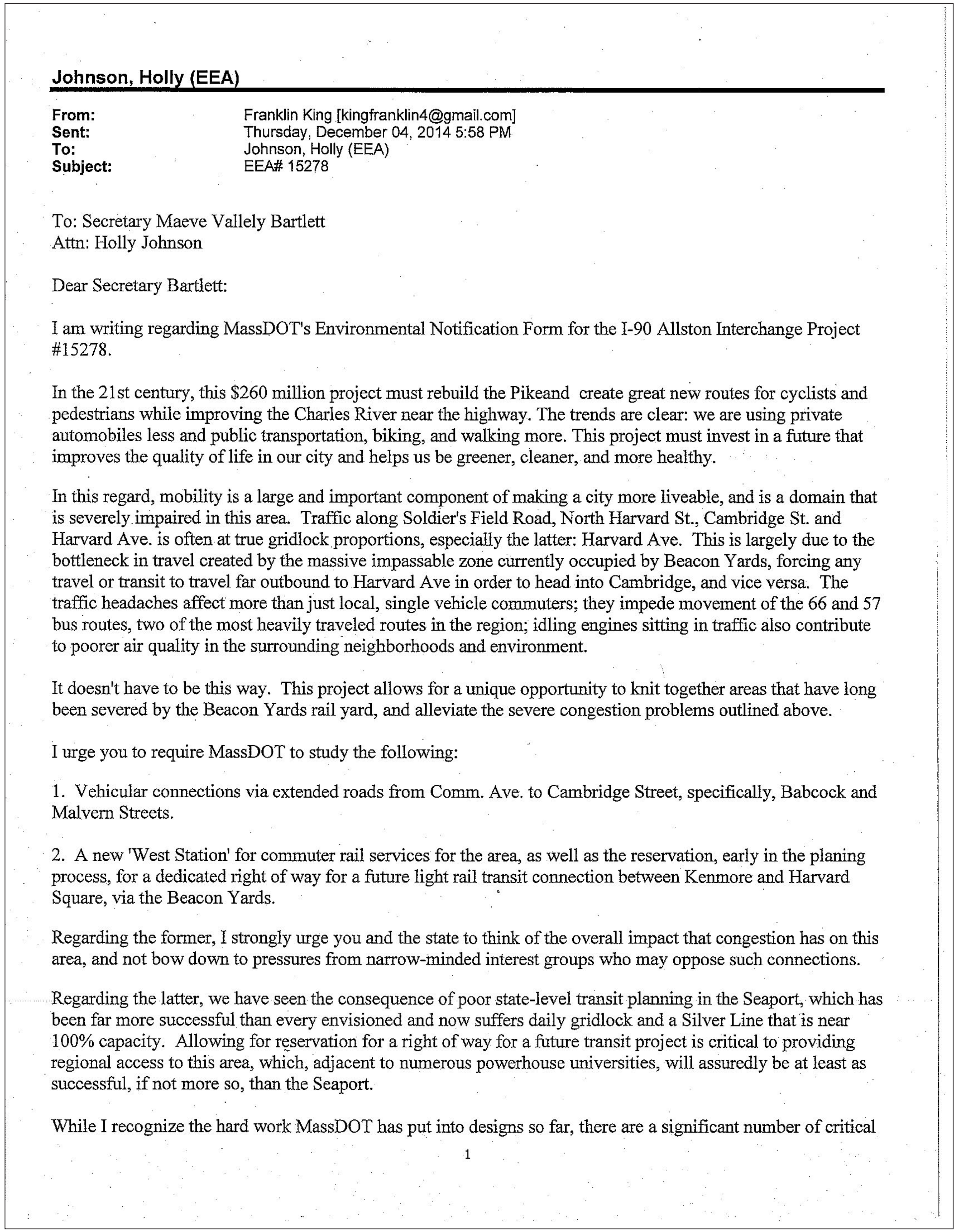

Johnson, Holly (EEA)

From: Franklin King [kingfranklin4@gmail.com]
Sent: Thursday, December 04, 2014 5:58 PM
To: Johnson, Holly (EEA)
Subject: EEA# 15278

To: Secretary Maeve Vallely Bartlett
Attn: Holly Johnson

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild the Pikeand create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

In this regard, mobility is a large and important component of making a city more liveable, and is a domain that is severely impaired in this area. Traffic along Soldier's Field Road, North Harvard St., Cambridge St. and Harvard Ave. is often at true gridlock proportions, especially the latter: Harvard Ave. This is largely due to the bottleneck in travel created by the massive impassable zone currently occupied by Beacon Yards, forcing any travel or transit to travel far outbound to Harvard Ave in order to head into Cambridge, and vice versa. The traffic headaches affect more than just local, single vehicle commuters; they impede movement of the 66 and 57 bus routes, two of the most heavily traveled routes in the region; idling engines sitting in traffic also contribute to poorer air quality in the surrounding neighborhoods and environment.

It doesn't have to be this way. This project allows for a unique opportunity to knit together areas that have long been severed by the Beacon Yards rail yard, and alleviate the severe congestion problems outlined above.

I urge you to require MassDOT to study the following:

1. Vehicular connections via extended roads from Comm. Ave. to Cambridge Street, specifically, Babcock and Malvern Streets.

2. A new 'West Station' for commuter rail services for the area, as well as the reservation, early in the planing process, for a dedicated right of way for a future light rail transit connection between Kenmore and Harvard Square, via the Beacon Yards.

Regarding the former, I strongly urge you and the state to think of the overall impact that congestion has on this area, and not bow down to pressures from narrow-minded interest groups who may oppose such connections.

Regarding the latter, we have seen the consequence of poor state-level transit planning in the Seaport, which has been far more successful than every envisioned and now suffers daily gridlock and a Silver Line that is near 100% capacity. Allowing for reservation for a right of way for a future transit project is critical to providing regional access to this area, which, adjacent to numerous powerhouse universities, will assuredly be at least as successful, if not more so, than the Seaport.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical

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issues unresolved. This is a project that affects more than just cars on the Mass Pike, and should address the broader issues of circulation now, before it is too late.

Sincerely,

Franklin King IV, MD
Boston

Johnson, Holly (EEA)

From: Priscilla Anderson [prilla32@gmail.com]
Sent: Thursday, December 04, 2014 4:11 PM
To: Johnson, Holly (EEA)
Cc: Harry Mattison
Subject: Fwd: [GardnerFriends] Help make Allston safer for cycling & walking and create new Charles River parklands

To holly.s.johnson@state.ma.us
Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less, and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

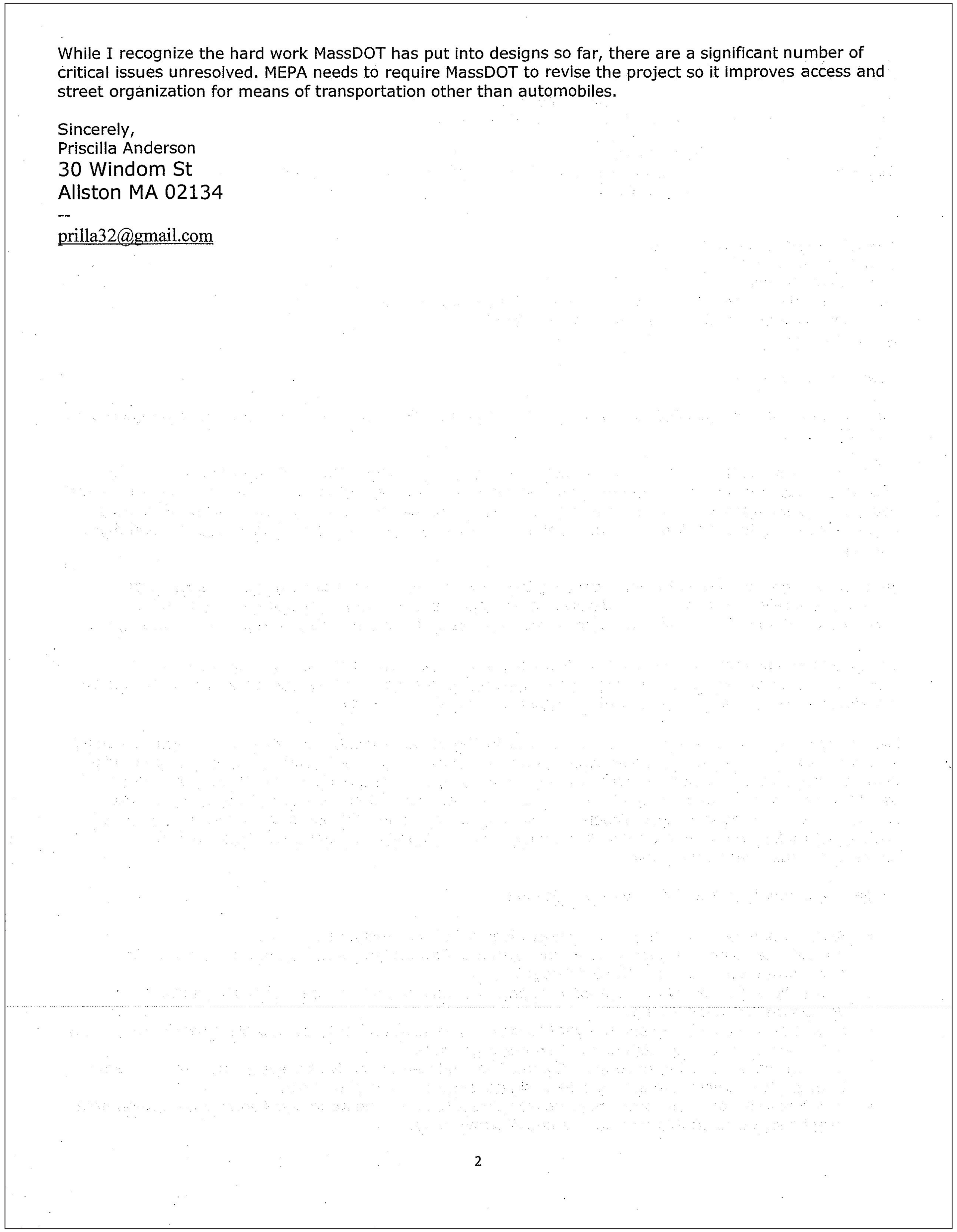
My husband and I both walk to work, crossing the Charles River on foot every day regardless of the weather. We rely on safe bridges, sidewalks, crosswalks, and crossing signals at intersections for pedestrians. We need to be able to co-exist with bicycles and vehicles safely at these river crossings.

I also feel strongly that the Charles River is a vital, living place, and that the flora and fauna that live there need to be protected and, in fact, encouraged to survive, so I want to see underpasses and lots of trees/bushes as opposed to large swaths of grass that needs to be mowed. PA-1

Mass transit via bus needs to be improved, especially the 66 bus (a long route that gets clogged up going PA-2
through Allston), so the idea of creating through roads from Comm Ave to Cambridge Street could help
alleviate that problem. I also live on a "through road" between Cambridge St and Western Ave that
should not be used by commercial traffic, but because the neighborhood is not well-designed, we are PA-3
awakened by large trucks and construction vehicles every morning. I'd like to see a new neighborhood
design that makes the commercial truck route clear and convenient for them, and thus make our
residential areas cleaner and quieter.

I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.



While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it improves access and street organization for means of transportation other than automobiles.

Sincerely,
Priscilla Anderson
30 Windom St
Allston MA 02134
--
prilla32@gmail.com

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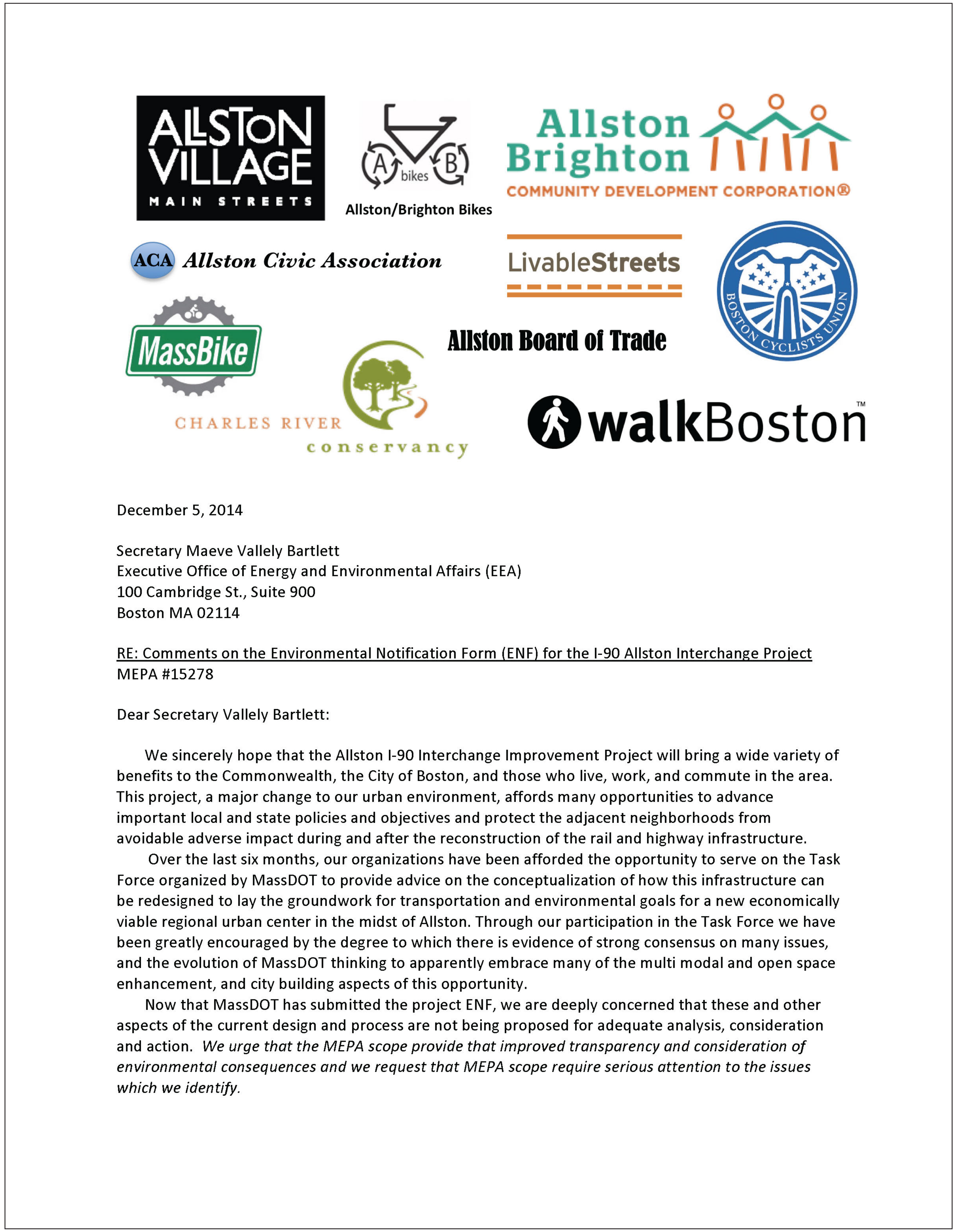


ALLSTON VILLAGE MAIN STREETS
Allston/Brighton Bikes
Allston Brighton Community Development Corporation®
ACA Allston Civic Association
LivableStreets
Boston Cyclists Union
MassBike
Allston Board of Trade
Charles River Conservancy
walkBoston™

December 5, 2014

Secretary Maeve Vallely Bartlett
Executive Office of Energy and Environmental Affairs (EEA)
100 Cambridge St., Suite 900
Boston MA 02114

RE: Comments on the Environmental Notification Form (ENF) for the I-90 Allston Interchange Project
MEPA #15278

Dear Secretary Vallely Bartlett:

We sincerely hope that the Allston I-90 Interchange Improvement Project will bring a wide variety of benefits to the Commonwealth, the City of Boston, and those who live, work, and commute in the area. This project, a major change to our urban environment, affords many opportunities to advance important local and state policies and objectives and protect the adjacent neighborhoods from avoidable adverse impact during and after the reconstruction of the rail and highway infrastructure.

Over the last six months, our organizations have been afforded the opportunity to serve on the Task Force organized by MassDOT to provide advice on the conceptualization of how this infrastructure can be redesigned to lay the groundwork for transportation and environmental goals for a new economically viable regional urban center in the midst of Allston. Through our participation in the Task Force we have been greatly encouraged by the degree to which there is evidence of strong consensus on many issues, and the evolution of MassDOT thinking to apparently embrace many of the multi modal and open space enhancement, and city building aspects of this opportunity.

Now that MassDOT has submitted the project ENF, we are deeply concerned that these and other aspects of the current design and process are not being proposed for adequate analysis, consideration and action. *We urge that the MEPA scope provide that improved transparency and consideration of environmental consequences and we request that MEPA scope require serious attention to the issues which we identify.*

Key concerns include:

- MassDOT should completely integrate planning and construction of the relocated Pike and the new West Station.
- In the area of West Station, the Turnpike and rail lines should be decked over to enable Smart Growth air rights development and to permit attractive and useful pedestrian, bicycle and bus access to West Station and between North and South Allston. Decking is essential to mitigate the nose and visual impacts from the rail and highway operations so close to residences.
- A wide riverside park, the "Allston Esplanade," should extend between the BU Bridge and the River Street Bridge. This is appropriate mitigation for the adverse impact to DCR parkland that appears to be inevitable during construction.
- Where Soldiers Field Road is parallel to the Turnpike, it should be moved closer to or under the Turnpike viaduct to allow a widening of the park along the Charles River.
- The Turnpike viaduct should not be widened beyond its current width and should not encroach on the Charles River parkland between the viaduct and Soldiers Field Road.
- Pedestrian and bicycle paths should extend across the project area, across Soldier's Field Road (on a new bridge structure) and into the Allston Esplanade, both as key elements of the purpose and need of the project and as essential elements of mitigation for likely adverse impacts during construction.
- MassDOT should have an ongoing planning process for the Turnpike Relocation and West Station that involves residents and advocacy groups by incorporating the existing task force as a project Area Committee to provide public involvement throughout the finalization of planning and design and oversight during implementation.

With the exception of the first item – the recent integration of the I-90 Interchange project with West Station – none of these concerns are reflected in the ENF. We hope that with MEPA's review of the ENF, and the scoping of the DEIR, clear guidance and requirements will be set for the elements of study to address the significant concerns and questions that we detail in the comments below.

Thank you for your attention.

Allston Village Main Streets
Alana Olsen, Executive Director
Allston- Brighton Community Development Corp.
Carol Ridge-Martinez, Executive Director
Allston Board of Trade
Marc Kadish
Allston Civic Association
Paul Berkeley, President
Allston/Brighton Bikes
Galen Mook

Boston Cyclists' Union
Pete Stidman, Executive Director
Charles River Conservancy
Harry Mattison
LivableStreets Alliance
Matthew Danish
MassBike
Barbara Jacobson
WalkBoston
Wendy Landman, Executive Director

Residents of Allston:

Matthew Danish	Rochelle Dunne	Paola M. Ferrer, Esq.	Anabela Gomes
Bruce Houghton	Wayne Mackenzie	Rich Parr	Jessica Robertson

Cc: Francis A DePaola, MassDOT Highway Division
James Cerbone, MassDOT Highway Division
Mike O'Dowd, MassDOT Highway Division

- Local buses Allston-35
- Links to Green Line stations along Commonwealth Avenue Allston-36
- North-south transit routes, such as a possible Circumferential Bus transit route connecting transit stations such as Harvard Square and Ruggles with alternative, more direct routes to desired employment destinations between Harvard Square in Cambridge, Boston University, Longwood and BU's Medical Center in South End. Allston-37

Options for bus routes serving the study area should be examined, including:
- A bus-only or other connection between Cambridge Street and Commonwealth Avenue across the Turnpike and rail yards via Malvern, Alcorn or Babcock Streets. Allston-38
- Local bus routes, such as Route 66, diverted into West Station.

Bus access to West Station is extremely important and should receive special attention in the DEIR. *We request that the MEPA scope require a thorough examination of future cross-town, local and express bus services, as well as the use of air rights to provide bus access both to and from the station and the adjacent area south of the station nearer Commonwealth Avenue.* Allston-39

5. Bicycle and pedestrian connections

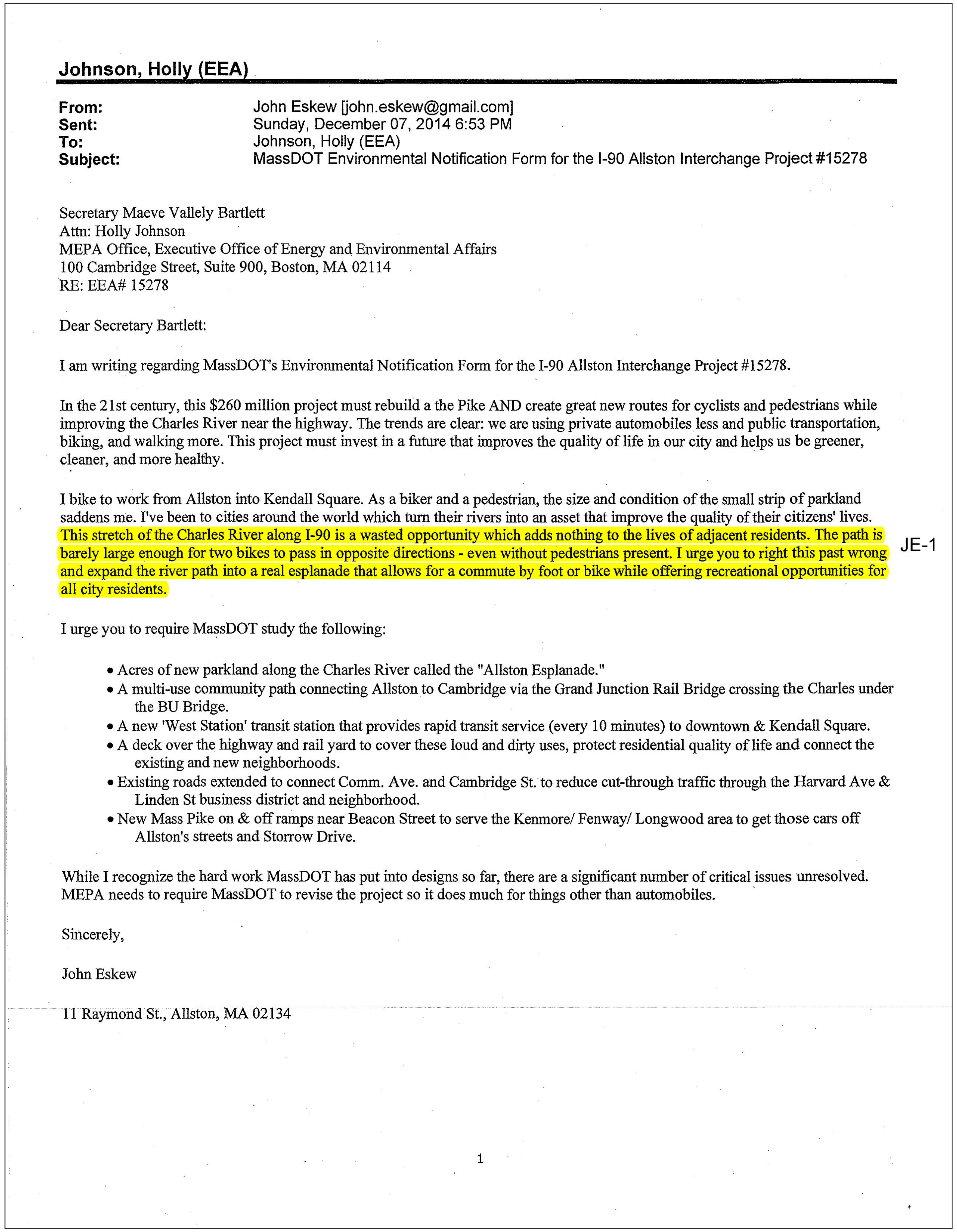
Proposals for pedestrian/bicycle routes should be made to maximize their potential future use.
- *The DEIR should explore a network of pedestrian/bicycle connections that are not tied to the web of roadways* to provide service in the 3,000 foot distance between Babcock Street and the Cambridge Street overpass of the Turnpike. Allston-40
- Pedestrian and bicycle connection options should also be examined for Malvern and Alcorn Streets, each very close to the proposed West Station, crossing north-south over the Turnpike and the rail yards. Allston-41
- *The DEIR should thoroughly explore options for walking and biking connections between Babcock Street and the Paul Dudley White Path* at the easternmost edge of the study area. Details of the Babcock Street connection to the river should show how it may serve as access to and from West Station. Analysis should include required elevation changes to make the connection. Allston-42
- *Additional north-south pedestrian/bicycle connections across the study area should result in options that provide access to West Station, BU and the local residential community.* Allston-43
- *The projected replacement of the existing Lincoln Street pedestrian bridge should be linked to future pedestrian and bicycle routes throughout the study area.* Allston-44

6. Motor vehicle and truck connections

The community has expressed significant concern that roadway connections should be explored that extend from Cambridge Street to Commonwealth Avenue. *The DEIR should include an analysis of options that connect Cambridge Street and Commonwealth Avenue that include:*
- *An option that provides access for pedestrians and bicycles only*
- *An option that provides access for buses, pedestrians and bicycles only* Allston-45
- *An option that provides access for commercial vehicles, buses, pedestrians and bicycles only*
- *An option that provides access for non-commercial vehicles, buses, pedestrians and bicycles only*
- *An option that provides access for all motor vehicle traffic, buses, pedestrians and bicycles.*

Without an investigation of these options, all traffic going between the Turnpike and areas south of the Turnpike (Back Bay, Longwood Medical Area, Brookline) must either use Storrow Drive or go through Allston via Harvard Street. Because of restrictions on Storrow Drive, this pattern requires ALL trucks to travel through the community.

We request that the MEPA scope require an analysis and comparison of connectivity options between Commonwealth Avenue and Cambridge Street, including access for pedestrians, bicycles, Allston-46



Johnson, Holly (EEA)

From: John Eskew [john.eskew@gmail.com]
Sent: Sunday, December 07, 2014 6:53 PM
To: Johnson, Holly (EEA)
Subject: MassDOT Environmental Notification Form for the I-90 Allston Interchange Project #15278

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

I bike to work from Allston into Kendall Square. As a biker and a pedestrian, the size and condition of the small strip of parkland saddens me. I've been to cities around the world which turn their rivers into an asset that improve the quality of their citizens' lives. This stretch of the Charles River along I-90 is a wasted opportunity which adds nothing to the lives of adjacent residents. The path is barely large enough for two bikes to pass in opposite directions - even without pedestrians present. I urge you to right this past wrong and expand the river path into a real esplanade that allows for a commute by foot or bike while offering recreational opportunities for all city residents. JE-1

I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

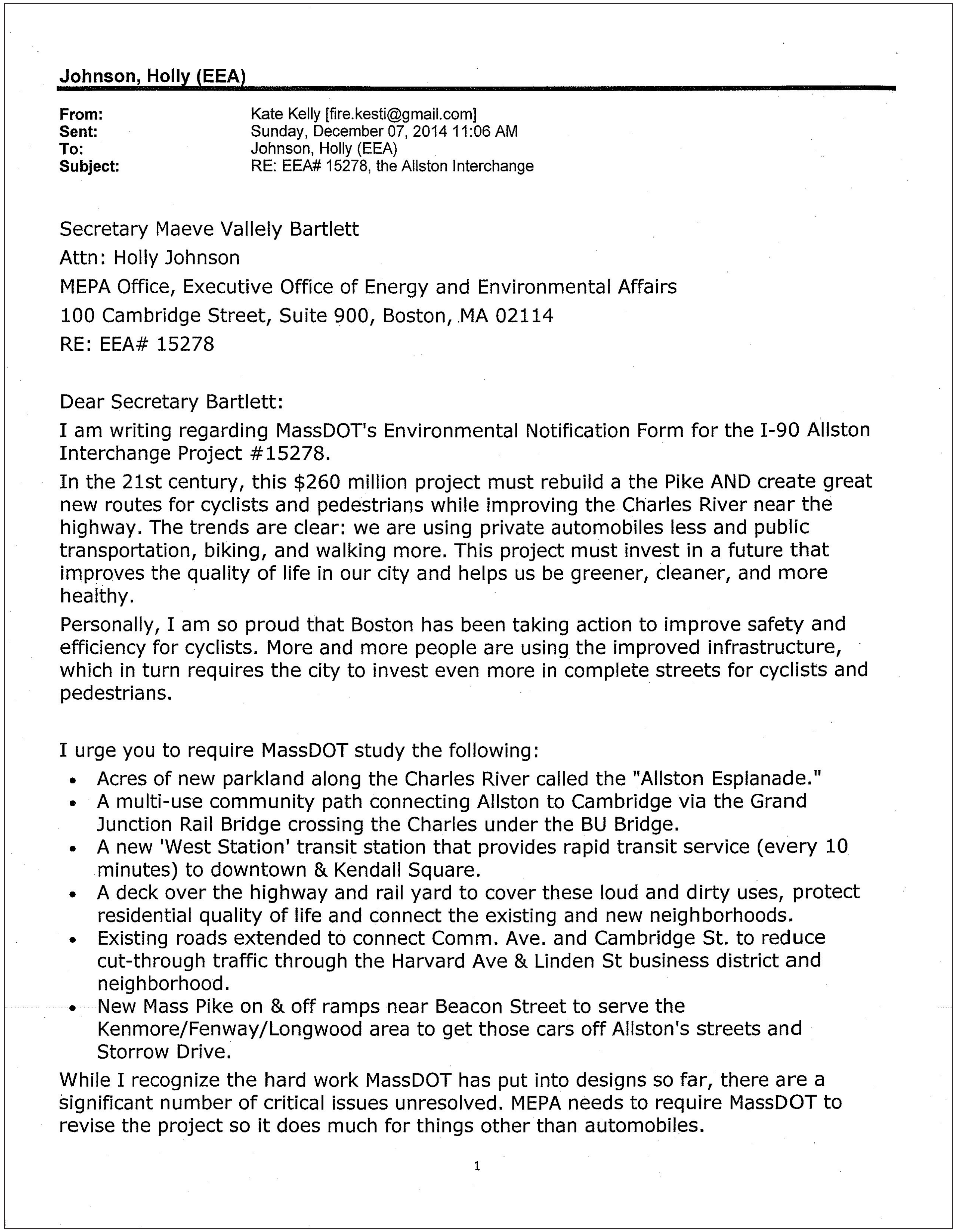
While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,

John Eskew

11 Raymond St., Allston, MA 02134

1



Johnson, Holly (EEA)

From: Kate Kelly [fire.kesti@gmail.com]
Sent: Sunday, December 07, 2014 11:06 AM
To: Johnson, Holly (EEA)
Subject: RE: EEA# 15278, the Allston Interchange

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

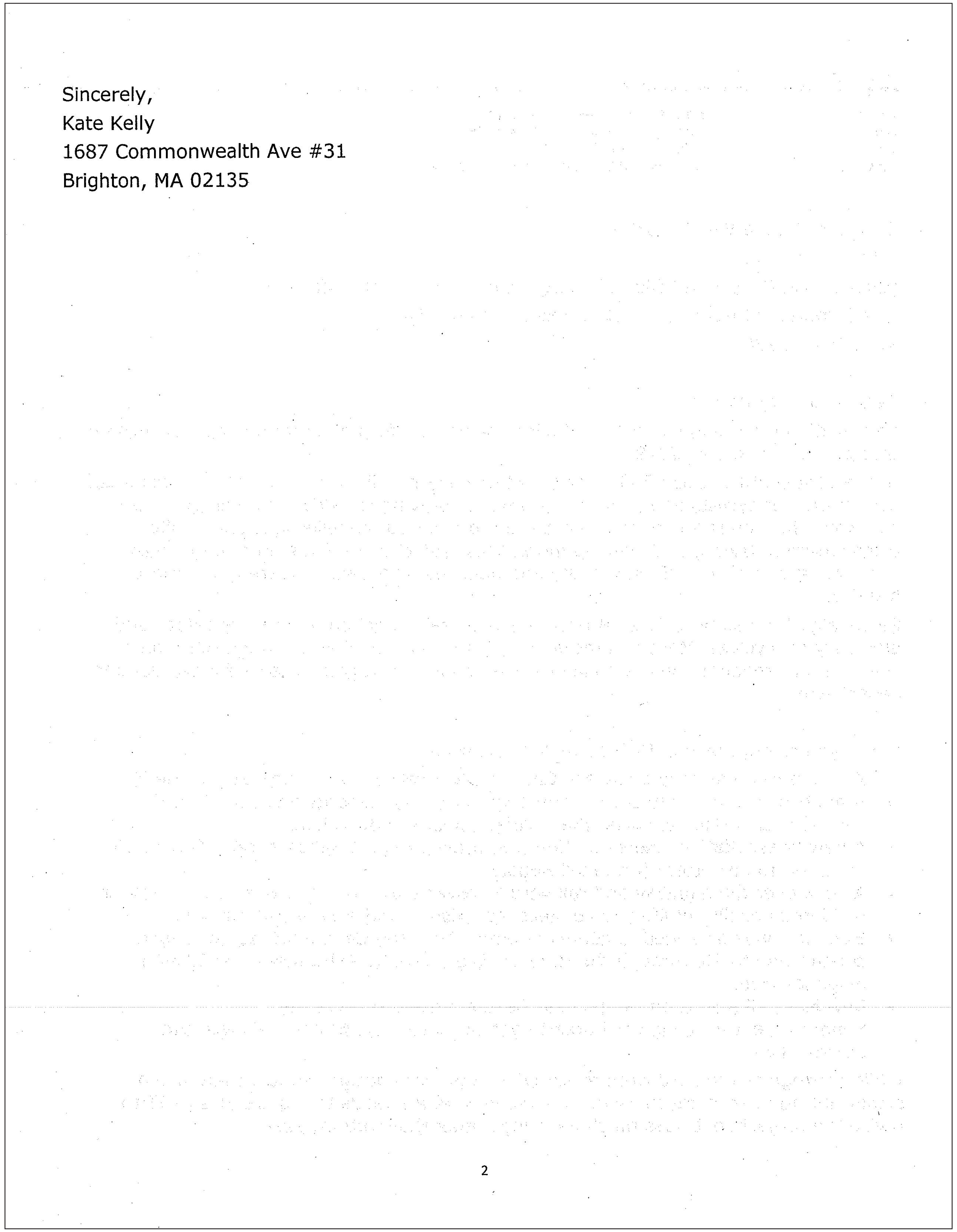
In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

Personally, I am so proud that Boston has been taking action to improve safety and efficiency for cyclists. More and more people are using the improved infrastructure, which in turn requires the city to invest even more in complete streets for cyclists and pedestrians.

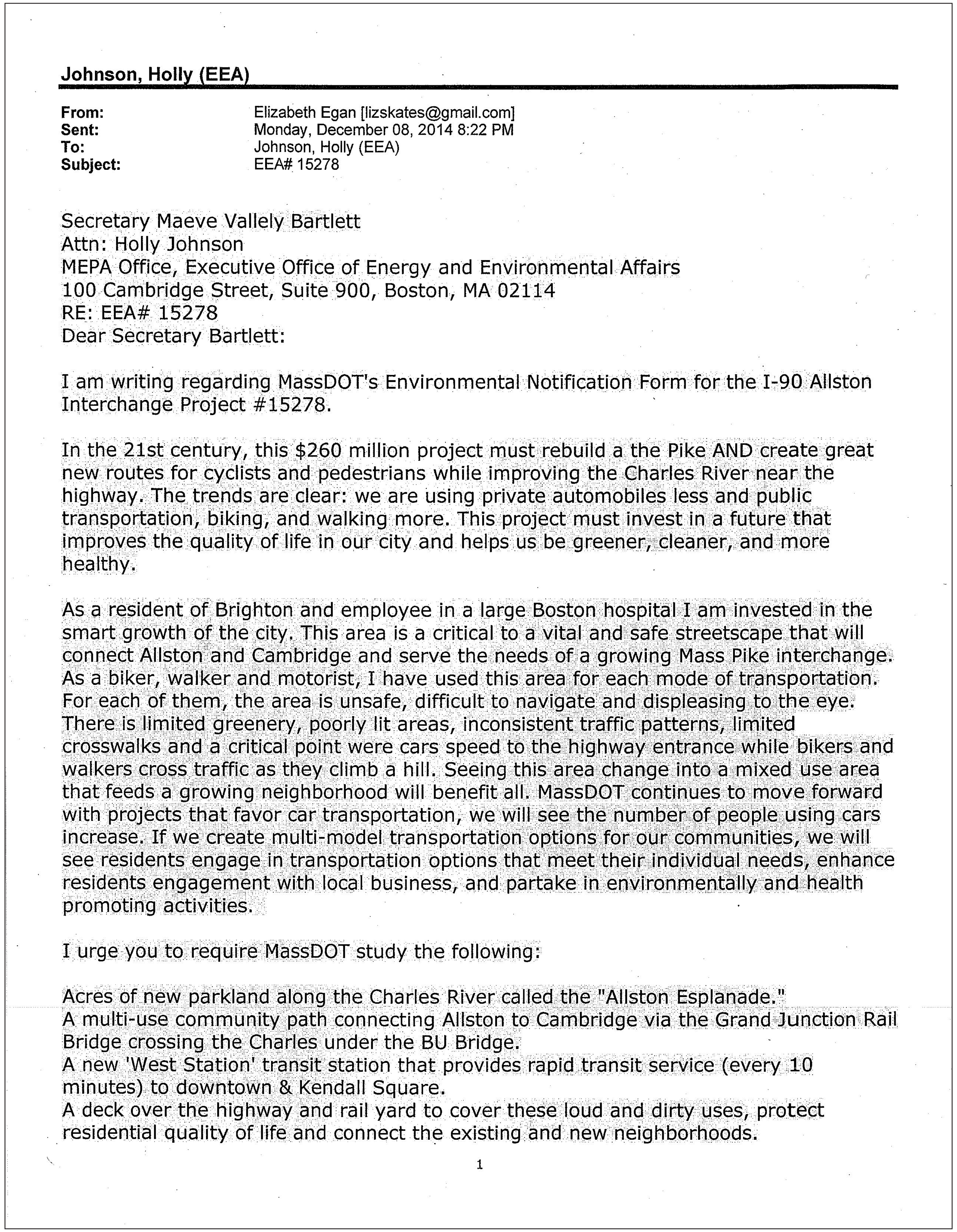
I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/Fenway/Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.



Sincerely,
Kate Kelly
1687 Commonwealth Ave #31
Brighton, MA 02135



Johnson, Holly (EEA)

From: Elizabeth Egan [lizskates@gmail.com]
Sent: Monday, December 08, 2014 8:22 PM
To: Johnson, Holly (EEA)
Subject: EEA# 15278

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278
Dear Secretary Bartlett:

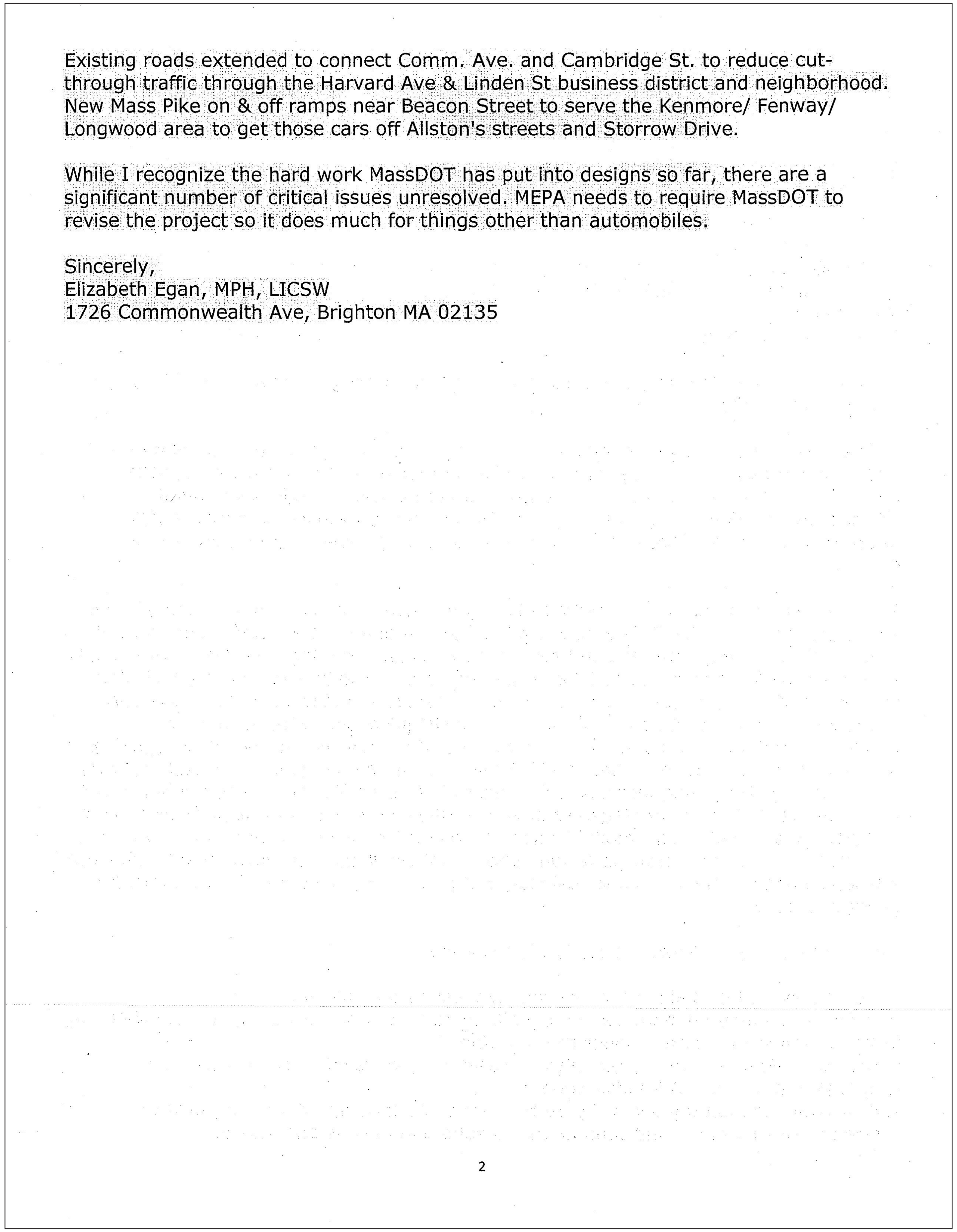
I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

In the 21st century, this $260 million project must rebuild a the Pike AND create great new routes for cyclists and pedestrians while improving the Charles River near the highway. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

As a resident of Brighton and employee in a large Boston hospital I am invested in the smart growth of the city. This area is a critical to a vital and safe streetscape that will connect Allston and Cambridge and serve the needs of a growing Mass Pike interchange. As a biker, walker and motorist, I have used this area for each mode of transportation. For each of them, the area is unsafe, difficult to navigate and displeasing to the eye. There is limited greenery, poorly lit areas, inconsistent traffic patterns, limited crosswalks and a critical point were cars speed to the highway entrance while bikers and walkers cross traffic as they climb a hill. Seeing this area change into a mixed use area that feeds a growing neighborhood will benefit all. MassDOT continues to move forward with projects that favor car transportation, we will see the number of people using cars increase. If we create multi-model transportation options for our communities, we will see residents engage in transportation options that meet their individual needs, enhance residents engagement with local business, and partake in environmentally and health promoting activities.

I urge you to require MassDOT study the following:

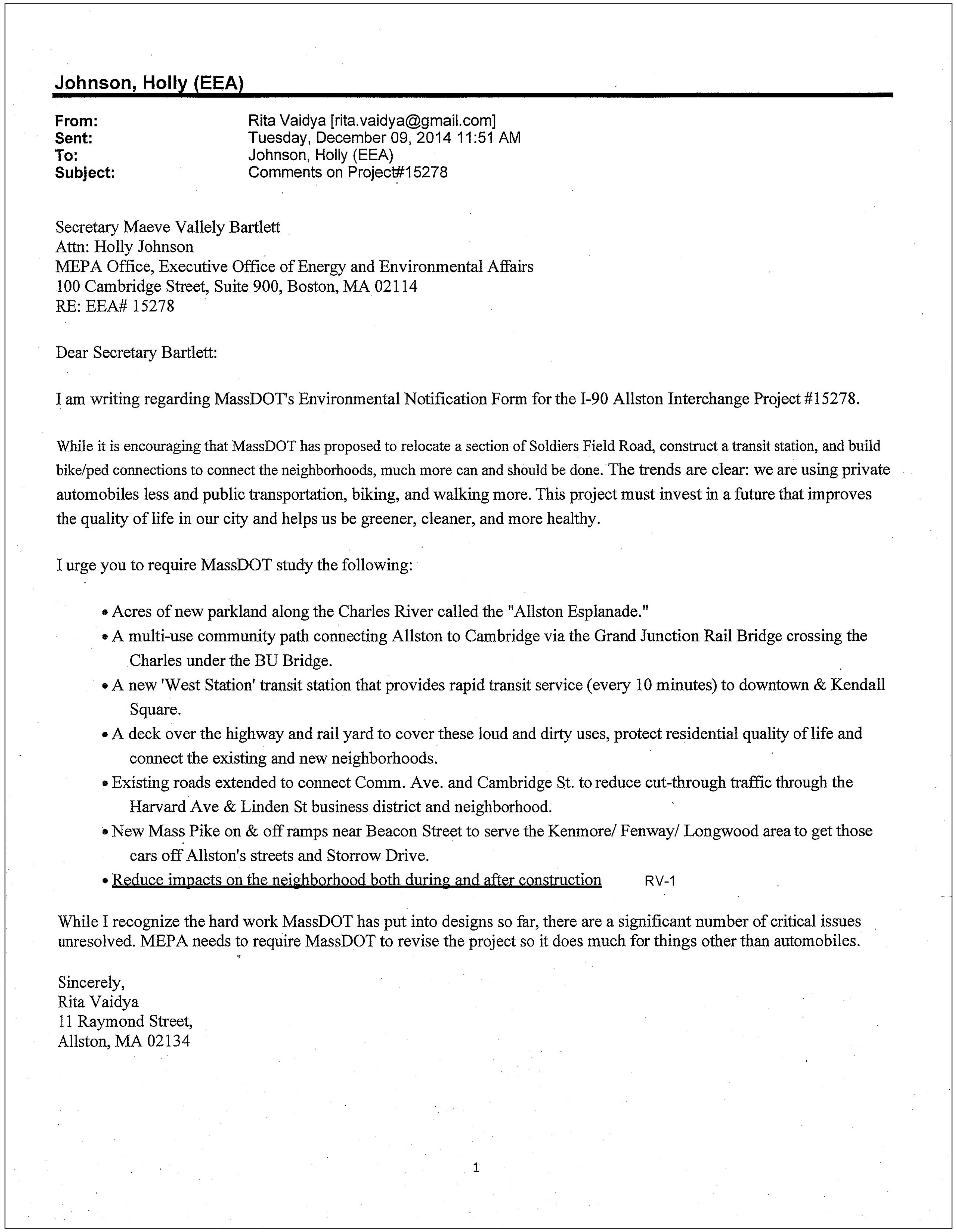
Acres of new parkland along the Charles River called the "Allston Esplanade."
A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.



Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,
Elizabeth Egan, MPH, LICSW
1726 Commonwealth Ave, Brighton MA 02135



Johnson, Holly (EEA)

From: Rita Vaidya [rita.vaidya@gmail.com]
Sent: Tuesday, December 09, 2014 11:51 AM
To: Johnson, Holly (EEA)
Subject: Comments on Project#15278

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278

Dear Secretary Bartlett:

I am writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

While it is encouraging that MassDOT has proposed to relocate a section of Soldiers Field Road, construct a transit station, and build bike/ped connections to connect the neighborhoods, much more can and should be done. The trends are clear: we are using private automobiles less and public transportation, biking, and walking more. This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.

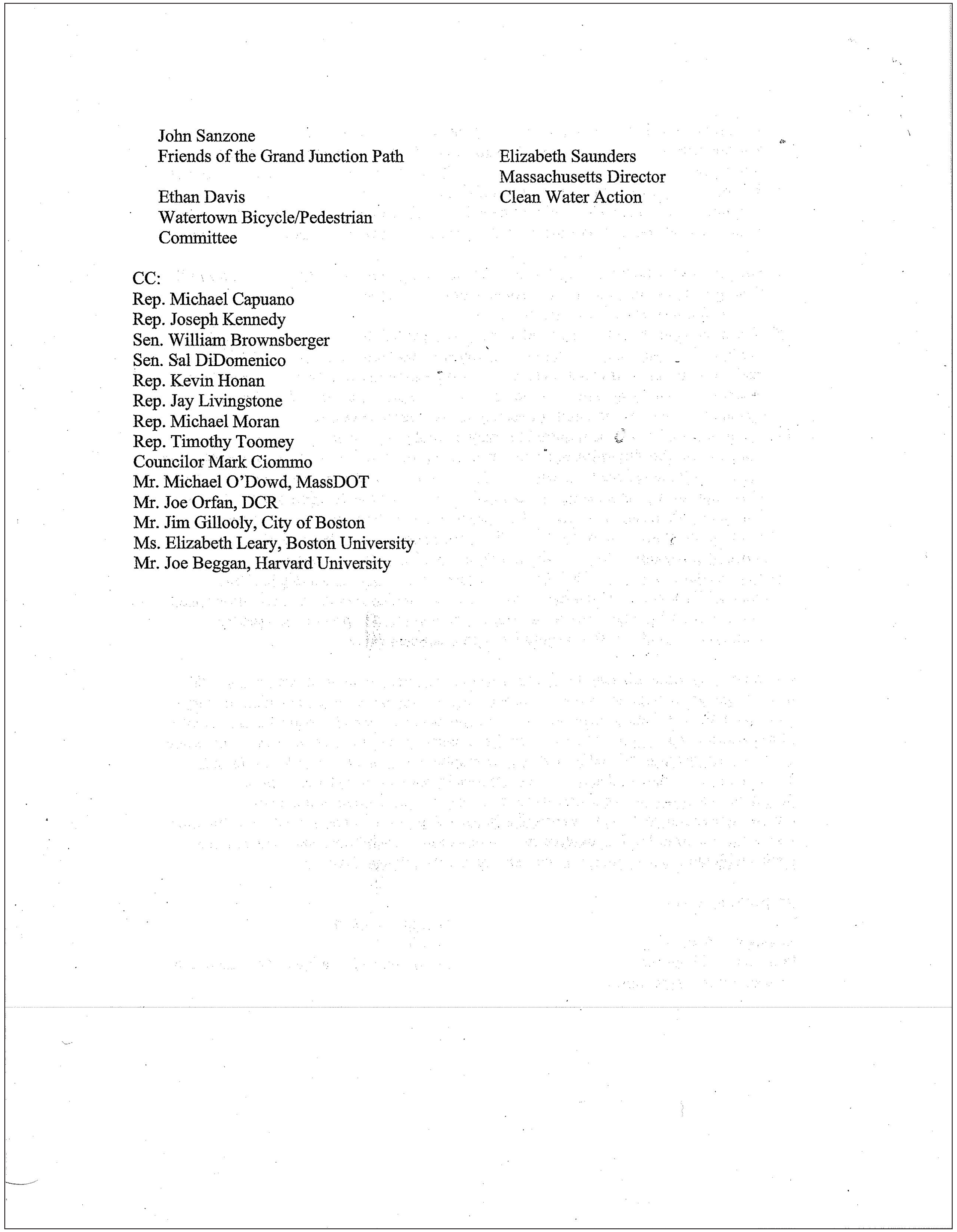
I urge you to require MassDOT study the following:

- Acres of new parkland along the Charles River called the "Allston Esplanade."
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge.
- A new 'West Station' transit station that provides rapid transit service (every 10 minutes) to downtown & Kendall Square.
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods.
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood.
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive.
- Reduce impacts on the neighborhood both during and after construction RV-1

While I recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles.

Sincerely,
Rita Vaidya
11 Raymond Street,
Allston, MA 02134

1

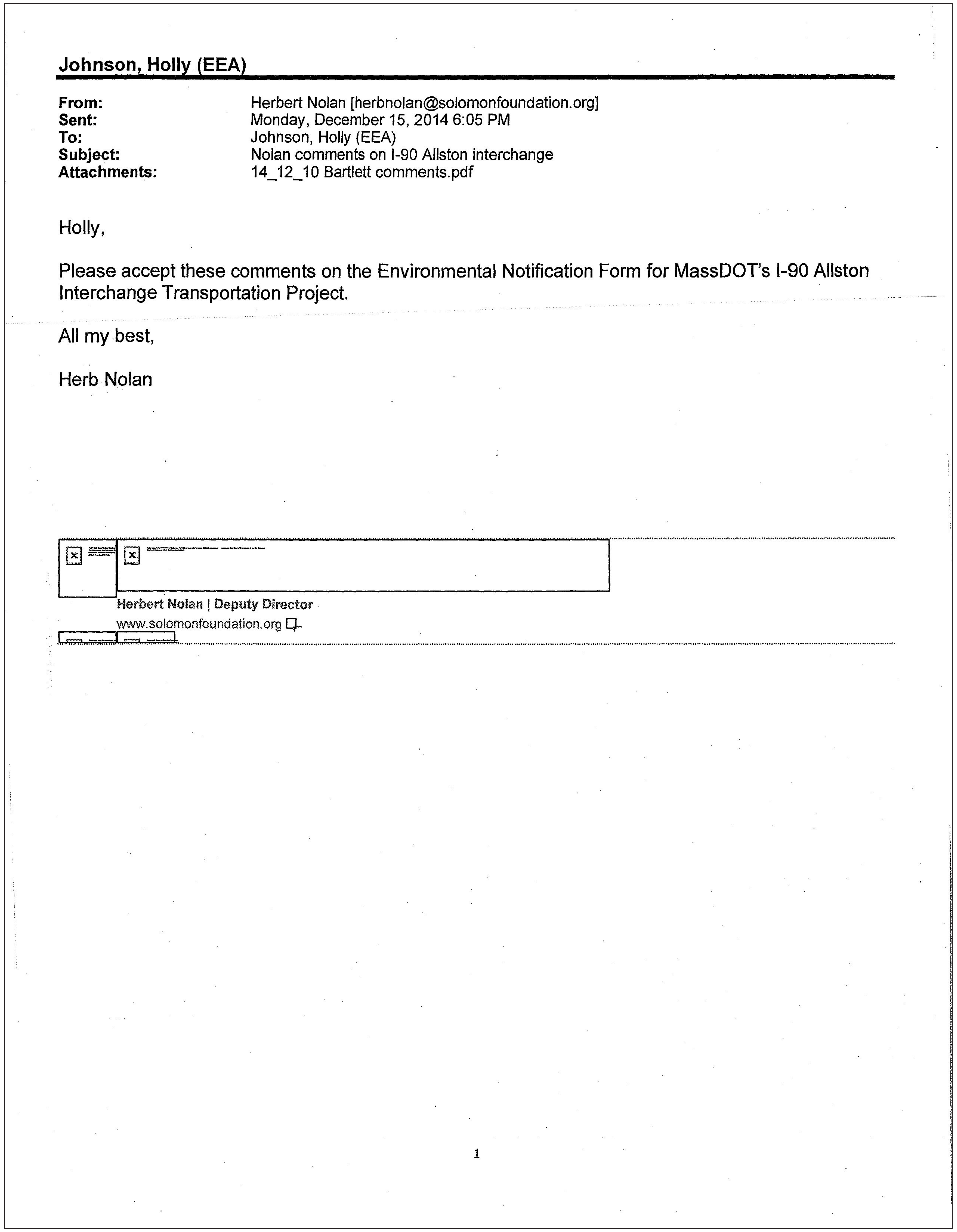


John Sanzone
Friends of the Grand Junction Path

Ethan Davis
Watertown Bicycle/Pedestrian
Committee

Elizabeth Saunders
Massachusetts Director
Clean Water Action

CC:
Rep. Michael Capuano
Rep. Joseph Kennedy
Sen. William Brownsberger
Sen. Sal DiDomenico
Rep. Kevin Honan
Rep. Jay Livingstone
Rep. Michael Moran
Rep. Timothy Toomey
Councilor Mark Ciommo
Mr. Michael O'Dowd, MassDOT
Mr. Joe Orfan, DCR
Mr. Jim Gillooly, City of Boston
Ms. Elizabeth Leary, Boston University
Mr. Joe Beggan, Harvard University



Johnson, Holly (EEA)

From: Herbert Nolan [herbnolan@solomonfoundation.org]
Sent: Monday, December 15, 2014 6:05 PM
To: Johnson, Holly (EEA)
Subject: Nolan comments on I-90 Allston interchange
Attachments: 14_12_10 Bartlett comments.pdf

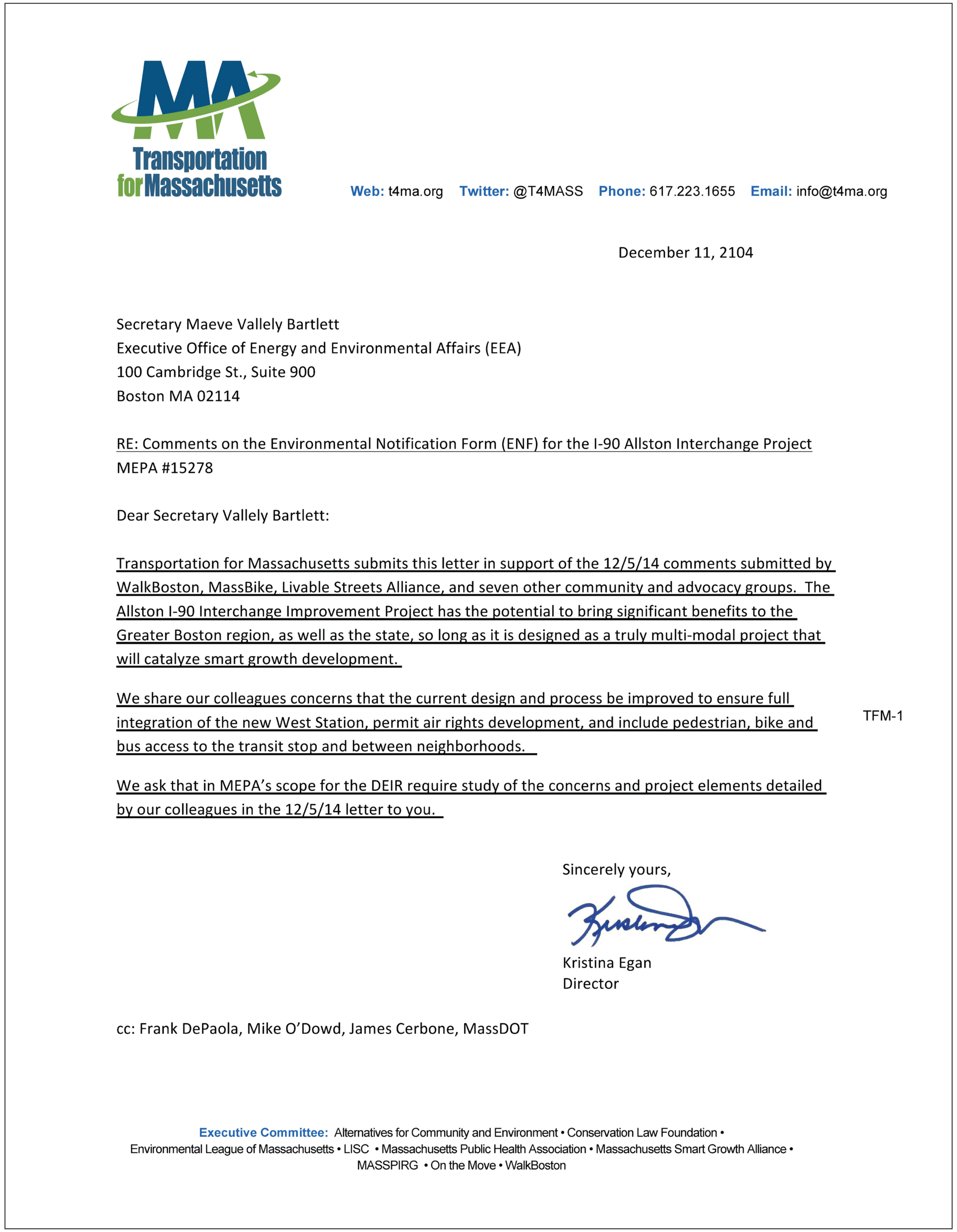
Holly,

Please accept these comments on the Environmental Notification Form for MassDOT's I-90 Allston Interchange Transportation Project.

All my best,

Herb Nolan

Herbert Nolan | **Deputy Director**
www.solomonfoundation.org



Transportation for Massachusetts
Web: t4ma.org **Twitter:** @T4MASS **Phone:** 617.223.1655 **Email:** info@t4ma.org

December 11, 2104

Secretary Maeve Vallely Bartlett
Executive Office of Energy and Environmental Affairs (EEA)
100 Cambridge St., Suite 900
Boston MA 02114

RE: Comments on the Environmental Notification Form (ENF) for the I-90 Allston Interchange Project
MEPA #15278

Dear Secretary Vallely Bartlett:

Transportation for Massachusetts submits this letter in support of the 12/5/14 comments submitted by WalkBoston, MassBike, Livable Streets Alliance, and seven other community and advocacy groups. The Allston I-90 Interchange Improvement Project has the potential to bring significant benefits to the Greater Boston region, as well as the state, so long as it is designed as a truly multi-modal project that will catalyze smart growth development.

We share our colleagues concerns that the current design and process be improved to ensure full integration of the new West Station, permit air rights development, and include pedestrian, bike and bus access to the transit stop and between neighborhoods. TFM-1

We ask that in MEPA's scope for the DEIR require study of the concerns and project elements detailed by our colleagues in the 12/5/14 letter to you.

Sincerely yours,

Kristina Egan
Director

cc: Frank DePaola, Mike O'Dowd, James Cerbone, MassDOT

Executive Committee: Alternatives for Community and Environment • Conservation Law Foundation • Environmental League of Massachusetts • LISC • Massachusetts Public Health Association • Massachusetts Smart Growth Alliance • MASSPIRG • On the Move • WalkBoston

Johnson, Holly (EEA)

From: Carol O'Hare [c.burchardohare@att.net]
Sent: Thursday, December 11, 2014 2:26 PM
To: Johnson, Holly (EEA)
Subject: "Allston I-90 Interchange Project," including repair, reconstruction, widening Pike Viaduct, across from C'port
Attachments: MassPike-ENF MEPAComments Re Project141211.doc; MassPike-CambridgeCommentsToDOT-141008.pdf

This Email + Attachment #1 constitute our comments, suggestions and concerns relating to noise and other anticipated effects of the Allston I-90 Interchange Project, including the repair, reconstruction and widening of the raised portion of the Turnpike (the Viaduct) across from Magazine Beach.

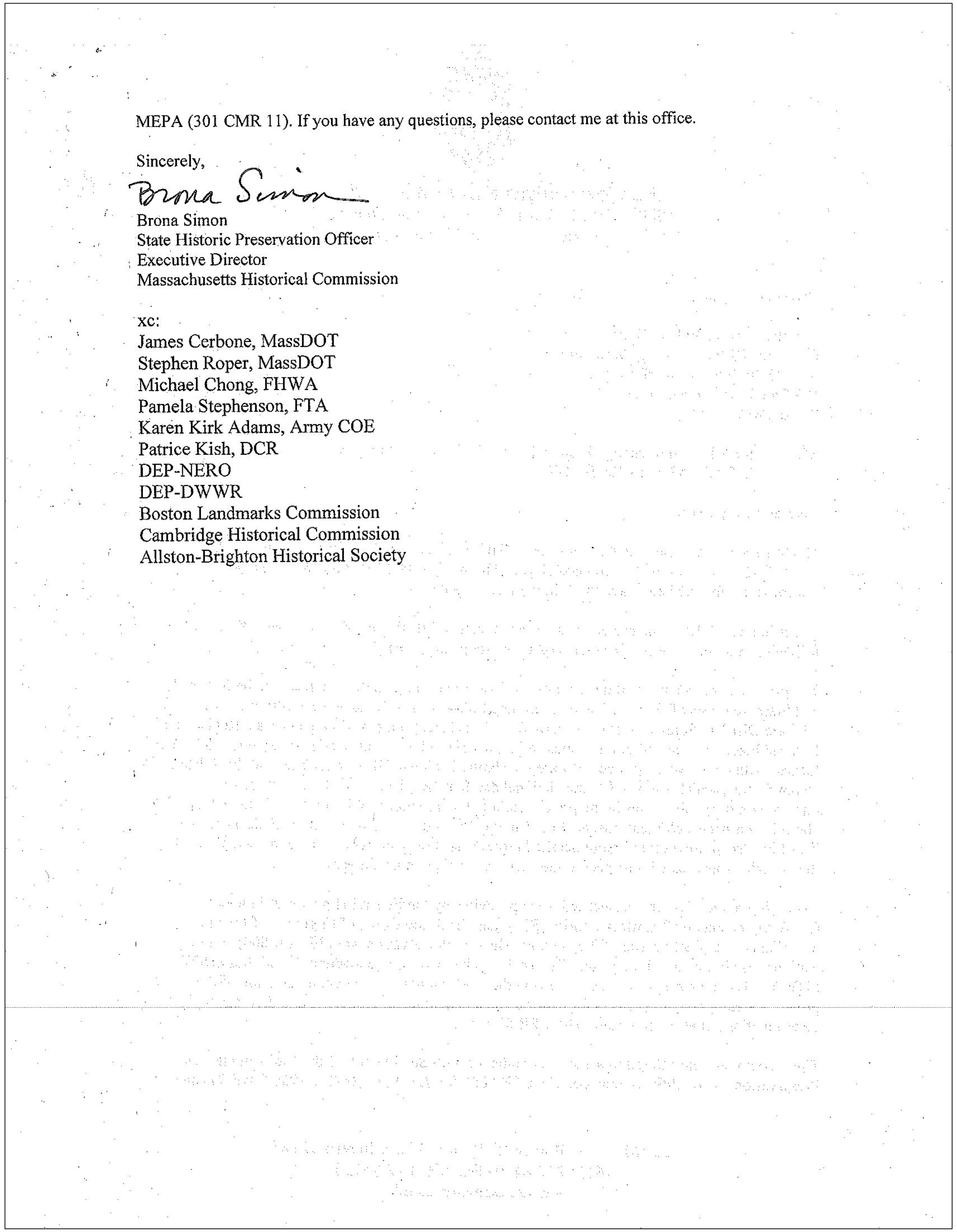
We are longtime Cambridgeport residents living two block from Memorial Drive. Those who enjoy Magazine Beach and Cambridgport residents now hear the traffic from the Mass Pike's raised roadway (Viaduct) just across the river. That's been significantly exacerbated by the sound transmitted/bounced back from B.U.'s high-rise dorms.

Since the start of the public process for this Project, Cambridge's interests seem to have been an afterthought. At the start of the public process, it required the intervention of our State Reps and City officials to get Cambridge members appointed to the Project's >40-member Community Task Force. Even the official Project name – "Allston I-90 Interchange Project" - reflects this seeming disregard by implying that the Project will only involve the redesign of the Turnpike's Allston Interchange. In fact, a significant component of the Project involves the major repair/construction and widening of the Viaduct just across the river adjacent to B.U.'s West Campus. CO/WM-1

While we generally agree with what Cambridge CDD and other personnel have said and written about this project, as residents of Cambridgeport, including their 10/8/14 comments, we have specific suggestions and concerns listed on our letter of today (**Attachment #1**). The City's October comments are also attached (**Attachment #2**). We understand that the City will be submitting its complete comments on or before the Mon., 12/15 deadline.

Thank you for your time, attention and, we hope, serious consideration.

Carol O'Hare and Walter McDonald
172 Magazine Street
Cambridge, MA 02139



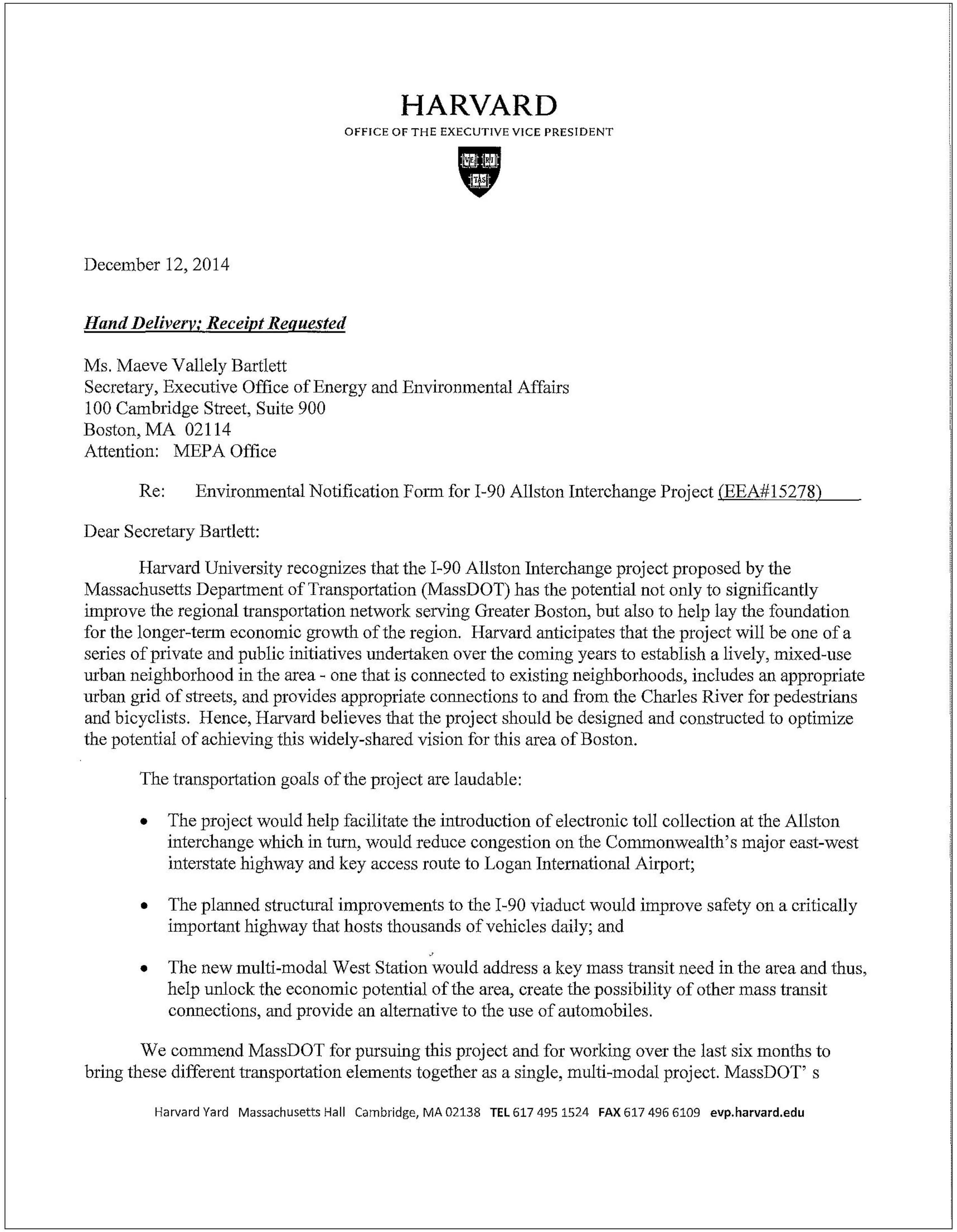
MEPA (301 CMR 11). If you have any questions, please contact me at this office.

Sincerely,

Brona Simon

Brona Simon
State Historic Preservation Officer
Executive Director
Massachusetts Historical Commission

xc:
James Cerbone, MassDOT
Stephen Roper, MassDOT
Michael Chong, FHWA
Pamela Stephenson, FTA
Karen Kirk Adams, Army COE
Patrice Kish, DCR
DEP-NERO
DEP-DWWR
Boston Landmarks Commission
Cambridge Historical Commission
Allston-Brighton Historical Society



HARVARD
OFFICE OF THE EXECUTIVE VICE PRESIDENT

December 12, 2014

Hand Delivery; Receipt Requested

Ms. Maeve Vallely Bartlett
Secretary, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114
Attention: MEPA Office

Re: Environmental Notification Form for I-90 Allston Interchange Project (EEA#15278)

Dear Secretary Bartlett:

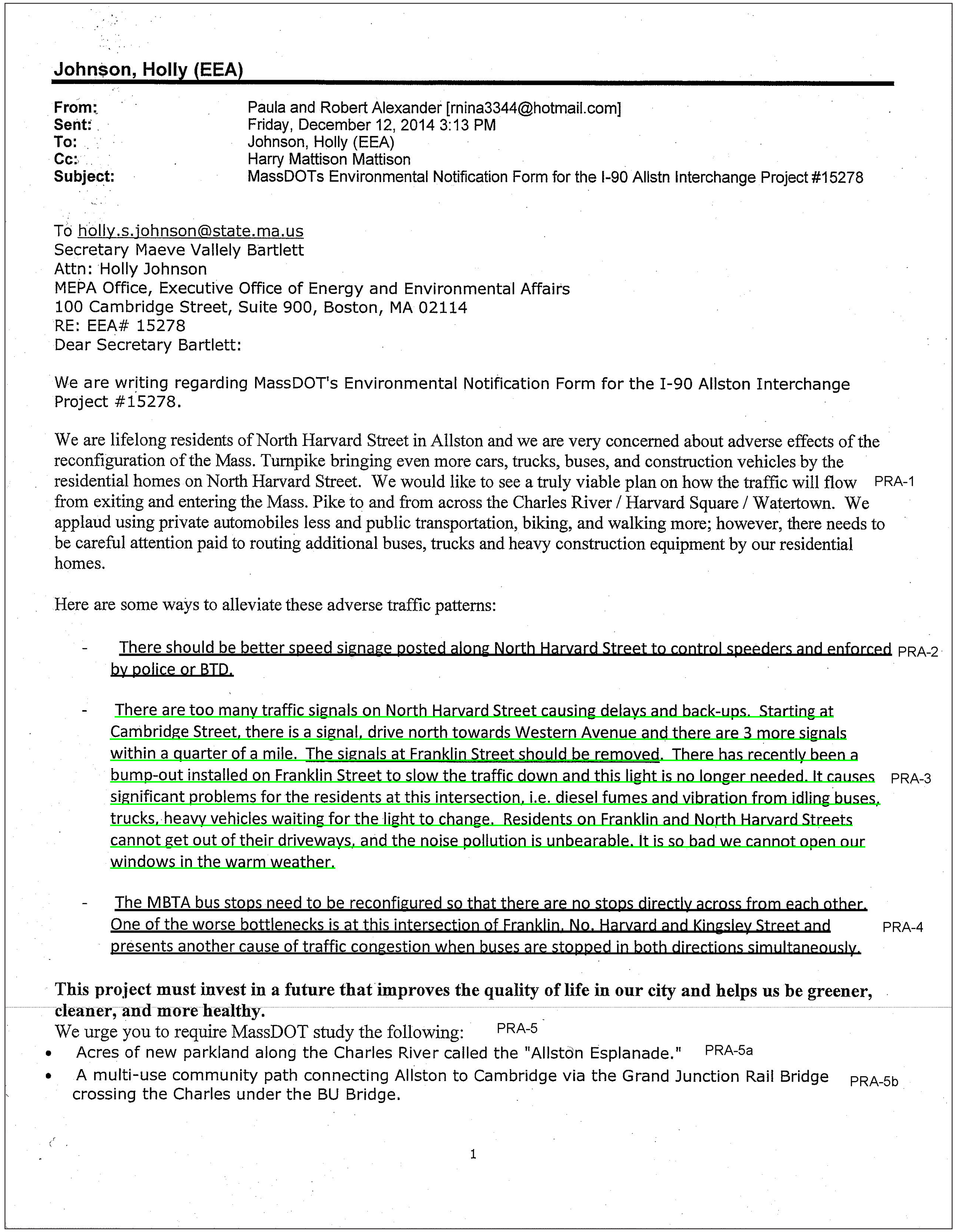
Harvard University recognizes that the I-90 Allston Interchange project proposed by the Massachusetts Department of Transportation (MassDOT) has the potential not only to significantly improve the regional transportation network serving Greater Boston, but also to help lay the foundation for the longer-term economic growth of the region. Harvard anticipates that the project will be one of a series of private and public initiatives undertaken over the coming years to establish a lively, mixed-use urban neighborhood in the area - one that is connected to existing neighborhoods, includes an appropriate urban grid of streets, and provides appropriate connections to and from the Charles River for pedestrians and bicyclists. Hence, Harvard believes that the project should be designed and constructed to optimize the potential of achieving this widely-shared vision for this area of Boston.

The transportation goals of the project are laudable:

- The project would help facilitate the introduction of electronic toll collection at the Allston interchange which in turn, would reduce congestion on the Commonwealth's major east-west interstate highway and key access route to Logan International Airport;
- The planned structural improvements to the I-90 viaduct would improve safety on a critically important highway that hosts thousands of vehicles daily; and
- The new multi-modal West Station would address a key mass transit need in the area and thus, help unlock the economic potential of the area, create the possibility of other mass transit connections, and provide an alternative to the use of automobiles.

We commend MassDOT for pursuing this project and for working over the last six months to bring these different transportation elements together as a single, multi-modal project. MassDOT' s

Harvard Yard Massachusetts Hall Cambridge, MA 02138 **TEL** 617 495 1524 **FAX** 617 496 6109 **evp.harvard.edu**



Johnson, Holly (EEA)

From: Paula and Robert Alexander [rnina3344@hotmail.com]
Sent: Friday, December 12, 2014 3:13 PM
To: Johnson, Holly (EEA)
Cc: Harry Mattison Mattison
Subject: MassDOTs Environmental Notification Form for the I-90 Allstn Interchange Project #15278

To holly.s.johnson@state.ma.us
Secretary Maeve Vallely Bartlett
Attn: Holly Johnson
MEPA Office, Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900, Boston, MA 02114
RE: EEA# 15278
Dear Secretary Bartlett:

We are writing regarding MassDOT's Environmental Notification Form for the I-90 Allston Interchange Project #15278.

We are lifelong residents of North Harvard Street in Allston and we are very concerned about adverse effects of the reconfiguration of the Mass. Turnpike bringing even more cars, trucks, buses, and construction vehicles by the residential homes on North Harvard Street. We would like to see a truly viable plan on how the traffic will flow from exiting and entering the Mass. Pike to and from across the Charles River / Harvard Square / Watertown. We applaud using private automobiles less and public transportation, biking, and walking more; however, there needs to be careful attention paid to routing additional buses, trucks and heavy construction equipment by our residential homes. PRA-1

Here are some ways to alleviate these adverse traffic patterns:

- There should be better speed signage posted along North Harvard Street to control speeders and enforced by police or BTD. PRA-2
- There are too many traffic signals on North Harvard Street causing delays and back-ups. Starting at Cambridge Street, there is a signal, drive north towards Western Avenue and there are 3 more signals within a quarter of a mile. The signals at Franklin Street should be removed. There has recently been a bump-out installed on Franklin Street to slow the traffic down and this light is no longer needed. It causes significant problems for the residents at this intersection, i.e. diesel fumes and vibration from idling buses, trucks, heavy vehicles waiting for the light to change. Residents on Franklin and North Harvard Streets cannot get out of their driveways, and the noise pollution is unbearable. It is so bad we cannot open our windows in the warm weather. PRA-3
- The MBTA bus stops need to be reconfigured so that there are no stops directly across from each other. One of the worse bottlenecks is at this intersection of Franklin, No. Harvard and Kingsley Street and presents another cause of traffic congestion when buses are stopped in both directions simultaneously. PRA-4

This project must invest in a future that improves the quality of life in our city and helps us be greener, cleaner, and more healthy.
We urge you to require MassDOT study the following: PRA-5

- Acres of new parkland along the Charles River called the "Allston Esplanade." PRA-5a
- A multi-use community path connecting Allston to Cambridge via the Grand Junction Rail Bridge crossing the Charles under the BU Bridge. PRA-5b

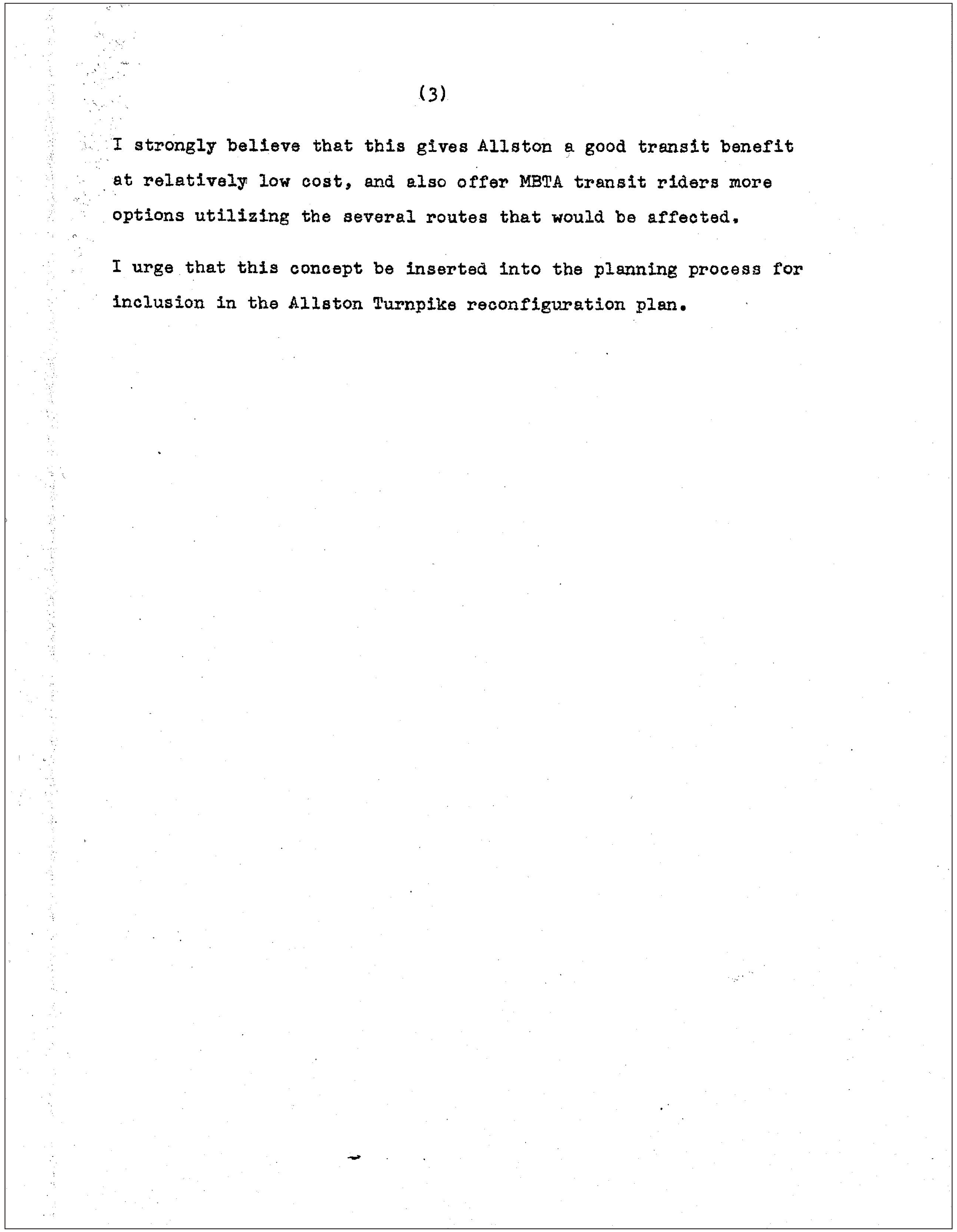
1

- A new 'West Station' transit station and space for cars to park that provides rapid transit service (every 10 minutes) to downtown & Kendall Square. PRA-5c
- A deck over the highway and rail yard to cover these loud and dirty uses, protect residential quality of life and connect the existing and new neighborhoods. PRA-5d
- Existing roads extended to connect Comm. Ave. and Cambridge St. to reduce cut-through traffic through the Harvard Ave & Linden St business district and neighborhood. PRA-5e
- New Mass Pike on & off ramps near Beacon Street to serve the Kenmore/ Fenway/ Longwood area to get those cars off Allston's streets and Storrow Drive. PRA-5f

While we recognize the hard work MassDOT has put into designs so far, there are a significant number of critical issues unresolved. MEPA needs to require MassDOT to revise the project so it does much for things other than automobiles and residential streets such as North Harvard, Windom in Allston.

Sincerely,

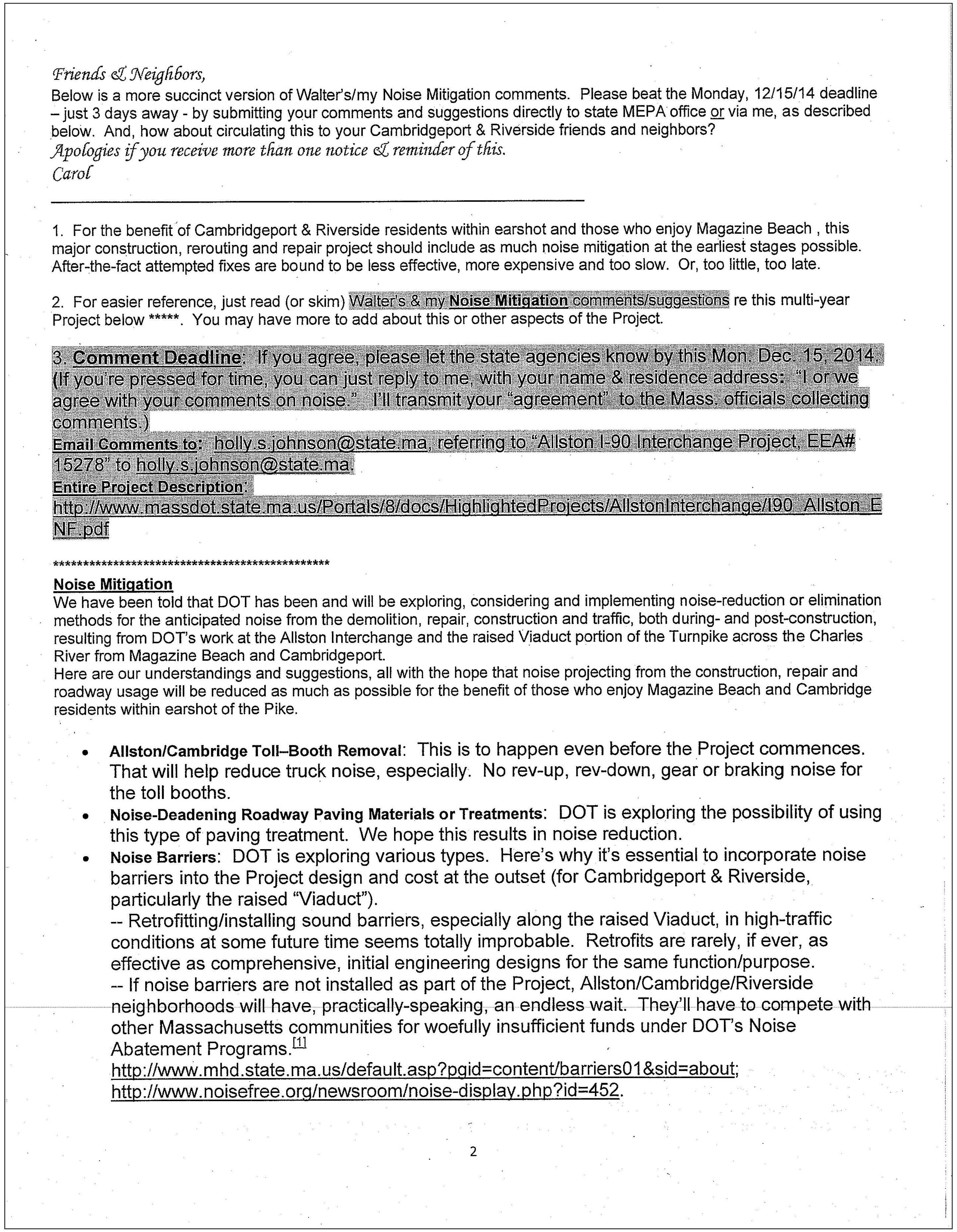
Robert and Paula Alexander
226 North Harvard St.
Allston, MA 02134



(3)

I strongly believe that this gives Allston a good transit benefit at relatively low cost, and also offer MBTA transit riders more options utilizing the several routes that would be affected.

I urge that this concept be inserted into the planning process for inclusion in the Allston Turnpike reconfiguration plan.



Friends & Neighbors,
Below is a more succinct version of Walter's/my Noise Mitigation comments. Please beat the Monday, 12/15/14 deadline – just 3 days away - by submitting your comments and suggestions directly to state MEPA office or via me, as described below. And, how about circulating this to your Cambridgeport & Riverside friends and neighbors?
Apologies if you receive more than one notice & reminder of this.
Carol

---

1. For the benefit of Cambridgeport & Riverside residents within earshot and those who enjoy Magazine Beach , this major construction, rerouting and repair project should include as much noise mitigation at the earliest stages possible. After-the-fact attempted fixes are bound to be less effective, more expensive and too slow. Or, too little, too late.

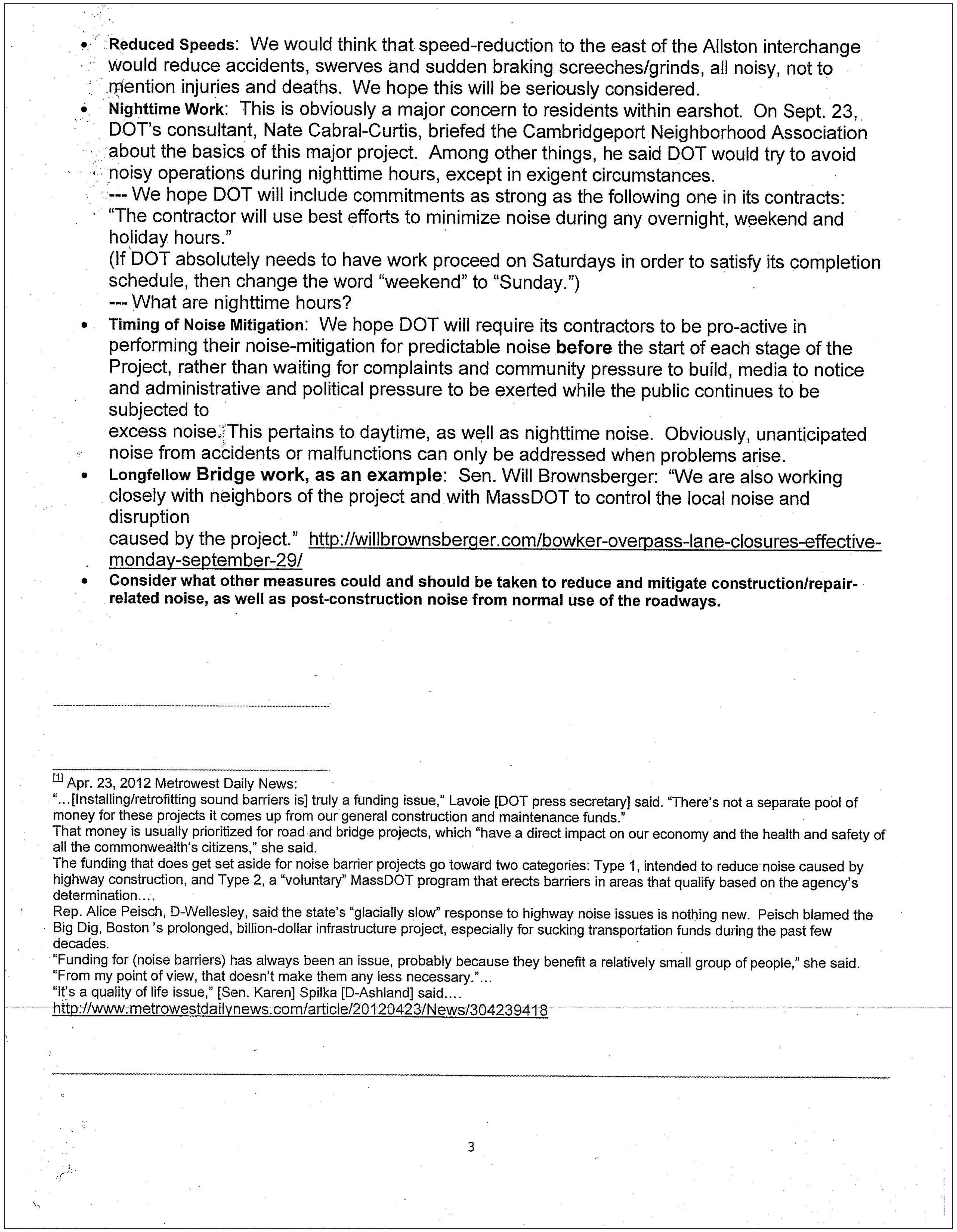
2. For easier reference, just read (or skim) Walter's & my **Noise Mitigation** comments/suggestions re this multi-year Project below *****. You may have more to add about this or other aspects of the Project.

3. **Comment Deadline**: If you agree, please let the state agencies know by this Mon. Dec. 15, 2014. (If you're pressed for time, you can just reply to me, with your name & residence address: "I or we agree with your comments on noise." I'll transmit your "agreement" to the Mass. officials collecting comments.)
Email Comments to: holly.s.johnson@state.ma, referring to "Allston I-90 Interchange Project, EEA# 15278" to holly.s.johnson@state.ma.
Entire Project Description:
http://www.massdot.state.ma.us/Portals/8/docs/HighlightedProjects/AllstonInterchange/I90_Allston_ENF.pdf

****

Noise Mitigation
We have been told that DOT has been and will be exploring, considering and implementing noise-reduction or elimination methods for the anticipated noise from the demolition, repair, construction and traffic, both during- and post-construction, resulting from DOT's work at the Allston Interchange and the raised Viaduct portion of the Turnpike across the Charles River from Magazine Beach and Cambridgeport.
Here are our understandings and suggestions, all with the hope that noise projecting from the construction, repair and roadway usage will be reduced as much as possible for the benefit of those who enjoy Magazine Beach and Cambridge residents within earshot of the Pike.

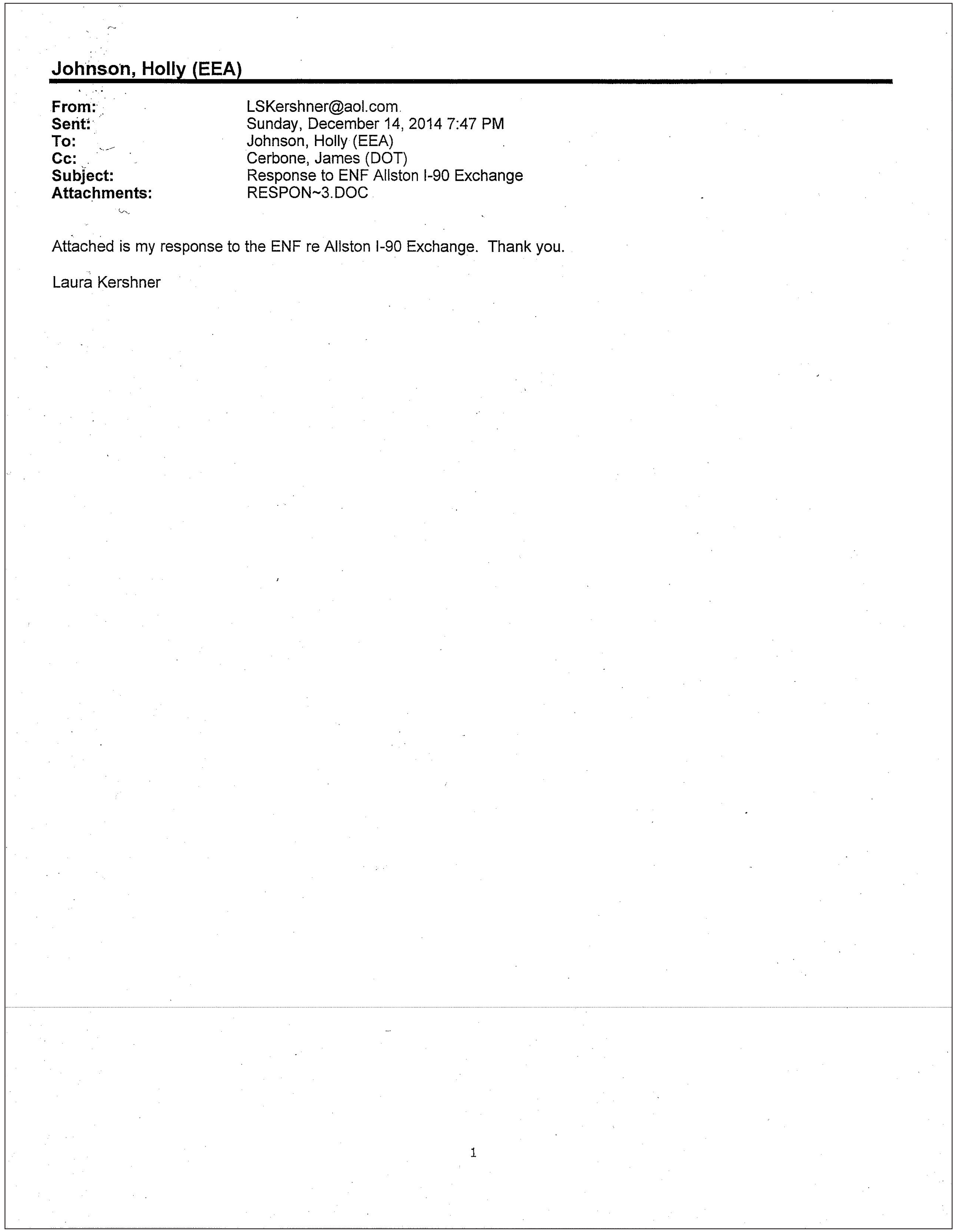
- **Allston/Cambridge Toll–Booth Removal**: This is to happen even before the Project commences. That will help reduce truck noise, especially. No rev-up, rev-down, gear or braking noise for the toll booths.
- **Noise-Deadening Roadway Paving Materials or Treatments**: DOT is exploring the possibility of using this type of paving treatment. We hope this results in noise reduction.
- **Noise Barriers**: DOT is exploring various types. Here's why it's essential to incorporate noise barriers into the Project design and cost at the outset (for Cambridgeport & Riverside, particularly the raised "Viaduct").
  -- Retrofitting/installing sound barriers, especially along the raised Viaduct, in high-traffic conditions at some future time seems totally improbable. Retrofits are rarely, if ever, as effective as comprehensive, initial engineering designs for the same function/purpose.
  -- If noise barriers are not installed as part of the Project, Allston/Cambridge/Riverside neighborhoods will have, practically-speaking, an endless wait. They'll have to compete with other Massachusetts communities for woefully insufficient funds under DOT's Noise Abatement Programs.[1]
  http://www.mhd.state.ma.us/default.asp?pgid=content/barriers01&sid=about;
  http://www.noisefree.org/newsroom/noise-display.php?id=452.



- **Reduced Speeds**: We would think that speed-reduction to the east of the Allston interchange would reduce accidents, swerves and sudden braking screeches/grinds, all noisy, not to mention injuries and deaths. We hope this will be seriously considered.
- **Nighttime Work**: This is obviously a major concern to residents within earshot. On Sept. 23, DOT's consultant, Nate Cabral-Curtis, briefed the Cambridgeport Neighborhood Association about the basics of this major project. Among other things, he said DOT would try to avoid noisy operations during nighttime hours, except in exigent circumstances.
--- We hope DOT will include commitments as strong as the following one in its contracts: "The contractor will use best efforts to minimize noise during any overnight, weekend and holiday hours."
(If DOT absolutely needs to have work proceed on Saturdays in order to satisfy its completion schedule, then change the word "weekend" to "Sunday.")
--- What are nighttime hours?
- **Timing of Noise Mitigation**: We hope DOT will require its contractors to be pro-active in performing their noise-mitigation for predictable noise **before** the start of each stage of the Project, rather than waiting for complaints and community pressure to build, media to notice and administrative and political pressure to be exerted while the public continues to be subjected to
excess noise. This pertains to daytime, as well as nighttime noise. Obviously, unanticipated noise from accidents or malfunctions can only be addressed when problems arise.
- **Longfellow Bridge work, as an example**: Sen. Will Brownsberger: "We are also working closely with neighbors of the project and with MassDOT to control the local noise and disruption
caused by the project." http://willbrownsberger.com/bowker-overpass-lane-closures-effective-monday-september-29/
- **Consider what other measures could and should be taken to reduce and mitigate construction/repair-related noise, as well as post-construction noise from normal use of the roadways.**

---

[1] Apr. 23, 2012 Metrowest Daily News:
"…[Installing/retrofitting sound barriers is] truly a funding issue," Lavoie [DOT press secretary] said. "There's not a separate pool of money for these projects it comes up from our general construction and maintenance funds."
That money is usually prioritized for road and bridge projects, which "have a direct impact on our economy and the health and safety of all the commonwealth's citizens," she said.
The funding that does get set aside for noise barrier projects go toward two categories: Type 1, intended to reduce noise caused by highway construction, and Type 2, a "voluntary" MassDOT program that erects barriers in areas that qualify based on the agency's determination….
Rep. Alice Peisch, D-Wellesley, said the state's "glacially slow" response to highway noise issues is nothing new. Peisch blamed the Big Dig, Boston 's prolonged, billion-dollar infrastructure project, especially for sucking transportation funds during the past few decades.
"Funding for (noise barriers) has always been an issue, probably because they benefit a relatively small group of people," she said. "From my point of view, that doesn't make them any less necessary."…
"It's a quality of life issue," [Sen. Karen] Spilka [D-Ashland] said….
http://www.metrowestdailynews.com/article/20120423/News/304239418



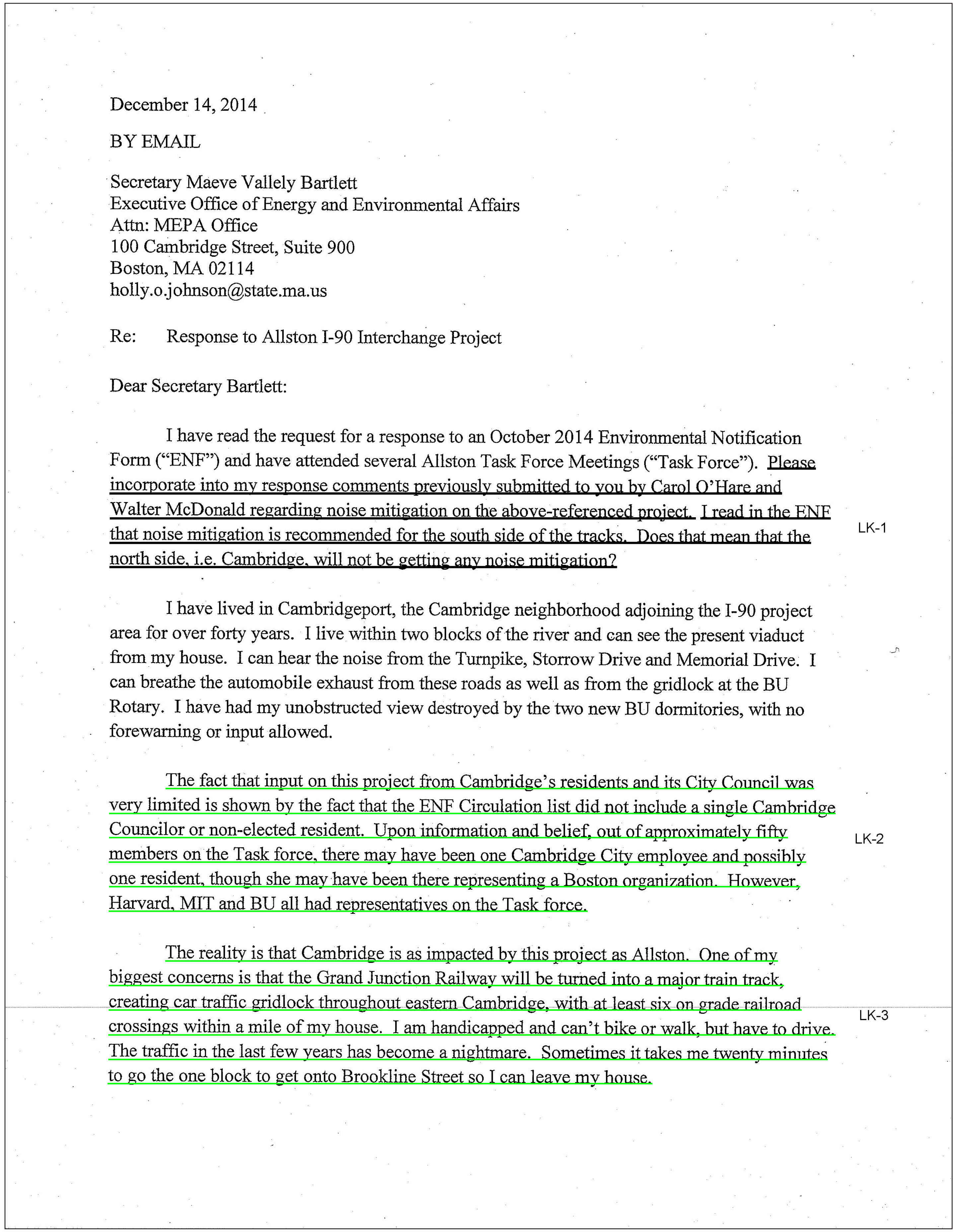
Johnson, Holly (EEA)

From: LSKershner@aol.com
Sent: Sunday, December 14, 2014 7:47 PM
To: Johnson, Holly (EEA)
Cc: Cerbone, James (DOT)
Subject: Response to ENF Allston I-90 Exchange
Attachments: RESPON~3.DOC

Attached is my response to the ENF re Allston I-90 Exchange. Thank you.

Laura Kershner

1



December 14, 2014

BY EMAIL

Secretary Maeve Vallely Bartlett
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114
holly.o.johnson@state.ma.us

Re: Response to Allston I-90 Interchange Project

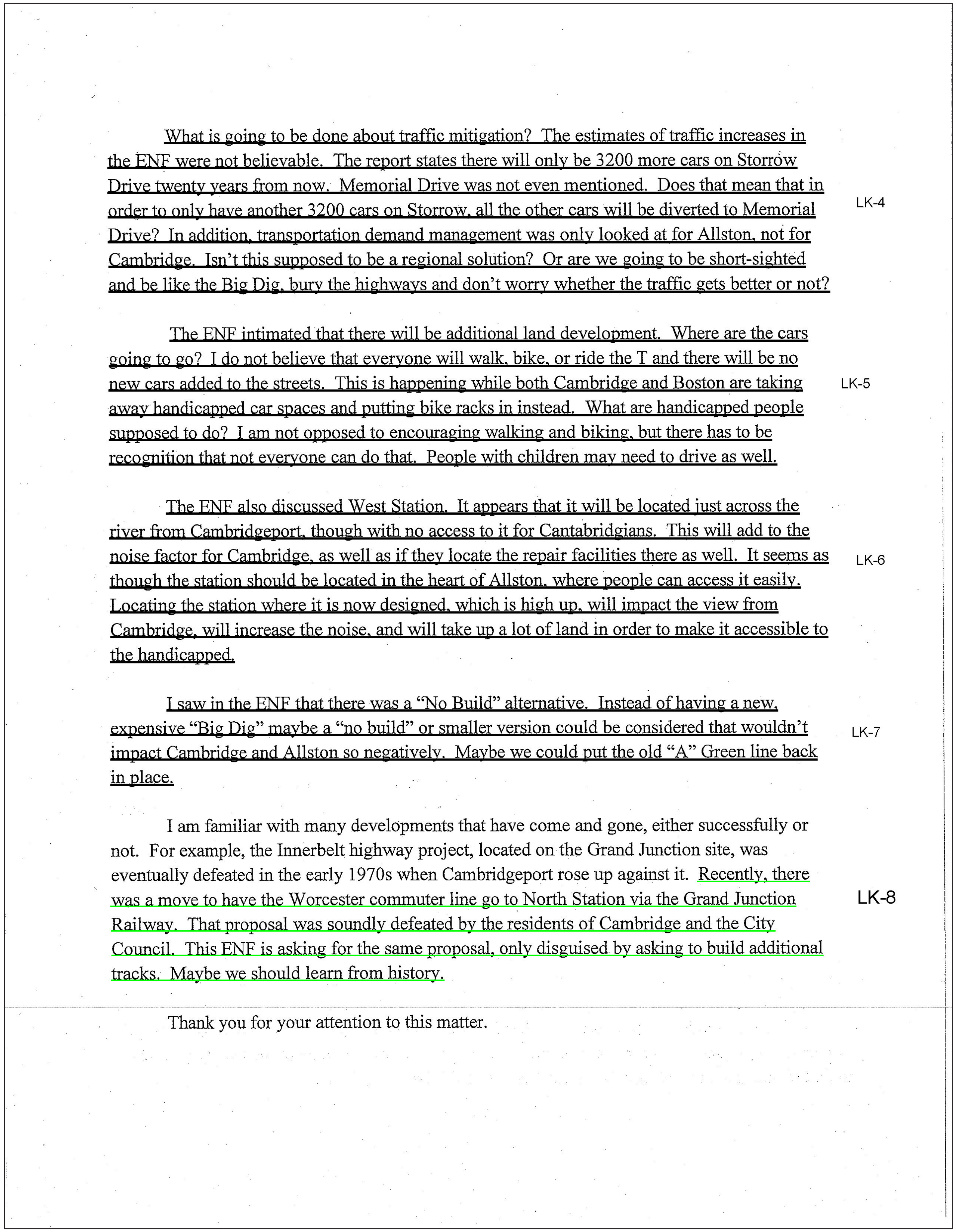
Dear Secretary Bartlett:

I have read the request for a response to an October 2014 Environmental Notification Form ("ENF") and have attended several Allston Task Force Meetings ("Task Force"). Please incorporate into my response comments previously submitted to you by Carol O'Hare and Walter McDonald regarding noise mitigation on the above-referenced project. I read in the ENF that noise mitigation is recommended for the south side of the tracks. Does that mean that the north side, i.e. Cambridge, will not be getting any noise mitigation? LK-1

I have lived in Cambridgeport, the Cambridge neighborhood adjoining the I-90 project area for over forty years. I live within two blocks of the river and can see the present viaduct from my house. I can hear the noise from the Turnpike, Storrow Drive and Memorial Drive. I can breathe the automobile exhaust from these roads as well as from the gridlock at the BU Rotary. I have had my unobstructed view destroyed by the two new BU dormitories, with no forewarning or input allowed.

The fact that input on this project from Cambridge's residents and its City Council was very limited is shown by the fact that the ENF Circulation list did not include a single Cambridge Councilor or non-elected resident. Upon information and belief, out of approximately fifty members on the Task force, there may have been one Cambridge City employee and possibly one resident, though she may have been there representing a Boston organization. However, Harvard, MIT and BU all had representatives on the Task force. LK-2

The reality is that Cambridge is as impacted by this project as Allston. One of my biggest concerns is that the Grand Junction Railway will be turned into a major train track, creating car traffic gridlock throughout eastern Cambridge, with at least six on grade railroad crossings within a mile of my house. I am handicapped and can't bike or walk, but have to drive. The traffic in the last few years has become a nightmare. Sometimes it takes me twenty minutes to go the one block to get onto Brookline Street so I can leave my house. LK-3



What is going to be done about traffic mitigation? The estimates of traffic increases in the ENF were not believable. The report states there will only be 3200 more cars on Storrow Drive twenty years from now. Memorial Drive was not even mentioned. Does that mean that in order to only have another 3200 cars on Storrow, all the other cars will be diverted to Memorial Drive? In addition, transportation demand management was only looked at for Allston, not for Cambridge. Isn't this supposed to be a regional solution? Or are we going to be short-sighted and be like the Big Dig, bury the highways and don't worry whether the traffic gets better or not? LK-4

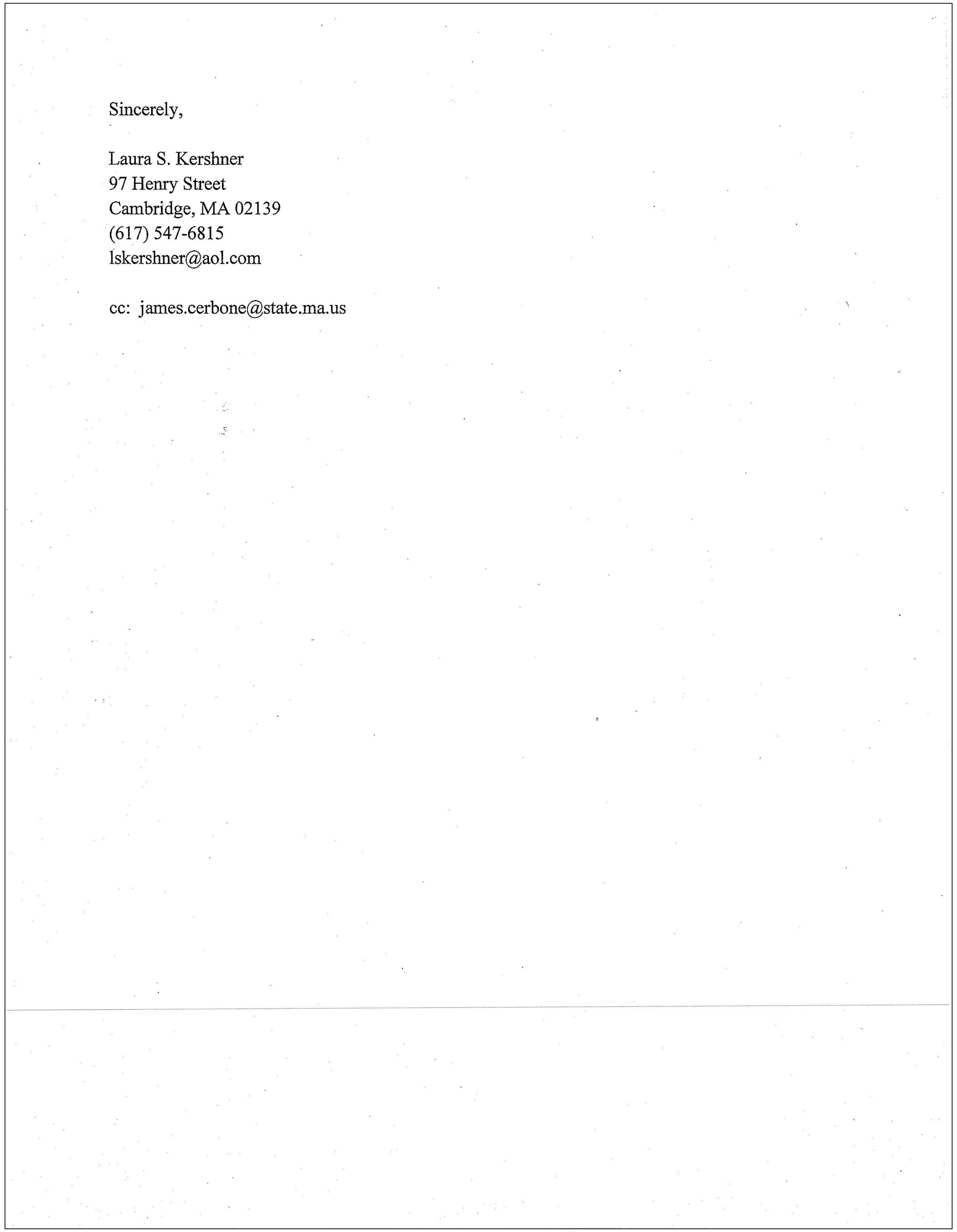
The ENF intimated that there will be additional land development. Where are the cars going to go? I do not believe that everyone will walk, bike, or ride the T and there will be no new cars added to the streets. This is happening while both Cambridge and Boston are taking away handicapped car spaces and putting bike racks in instead. What are handicapped people supposed to do? I am not opposed to encouraging walking and biking, but there has to be recognition that not everyone can do that. People with children may need to drive as well. LK-5

The ENF also discussed West Station. It appears that it will be located just across the river from Cambridgeport, though with no access to it for Cantabridgians. This will add to the noise factor for Cambridge, as well as if they locate the repair facilities there as well. It seems as though the station should be located in the heart of Allston, where people can access it easily. Locating the station where it is now designed, which is high up, will impact the view from Cambridge, will increase the noise, and will take up a lot of land in order to make it accessible to the handicapped. LK-6

I saw in the ENF that there was a "No Build" alternative. Instead of having a new, expensive "Big Dig" maybe a "no build" or smaller version could be considered that wouldn't impact Cambridge and Allston so negatively. Maybe we could put the old "A" Green line back in place. LK-7

I am familiar with many developments that have come and gone, either successfully or not. For example, the Innerbelt highway project, located on the Grand Junction site, was eventually defeated in the early 1970s when Cambridgeport rose up against it. Recently, there was a move to have the Worcester commuter line go to North Station via the Grand Junction Railway. That proposal was soundly defeated by the residents of Cambridge and the City Council. This ENF is asking for the same proposal, only disguised by asking to build additional tracks. Maybe we should learn from history. LK-8

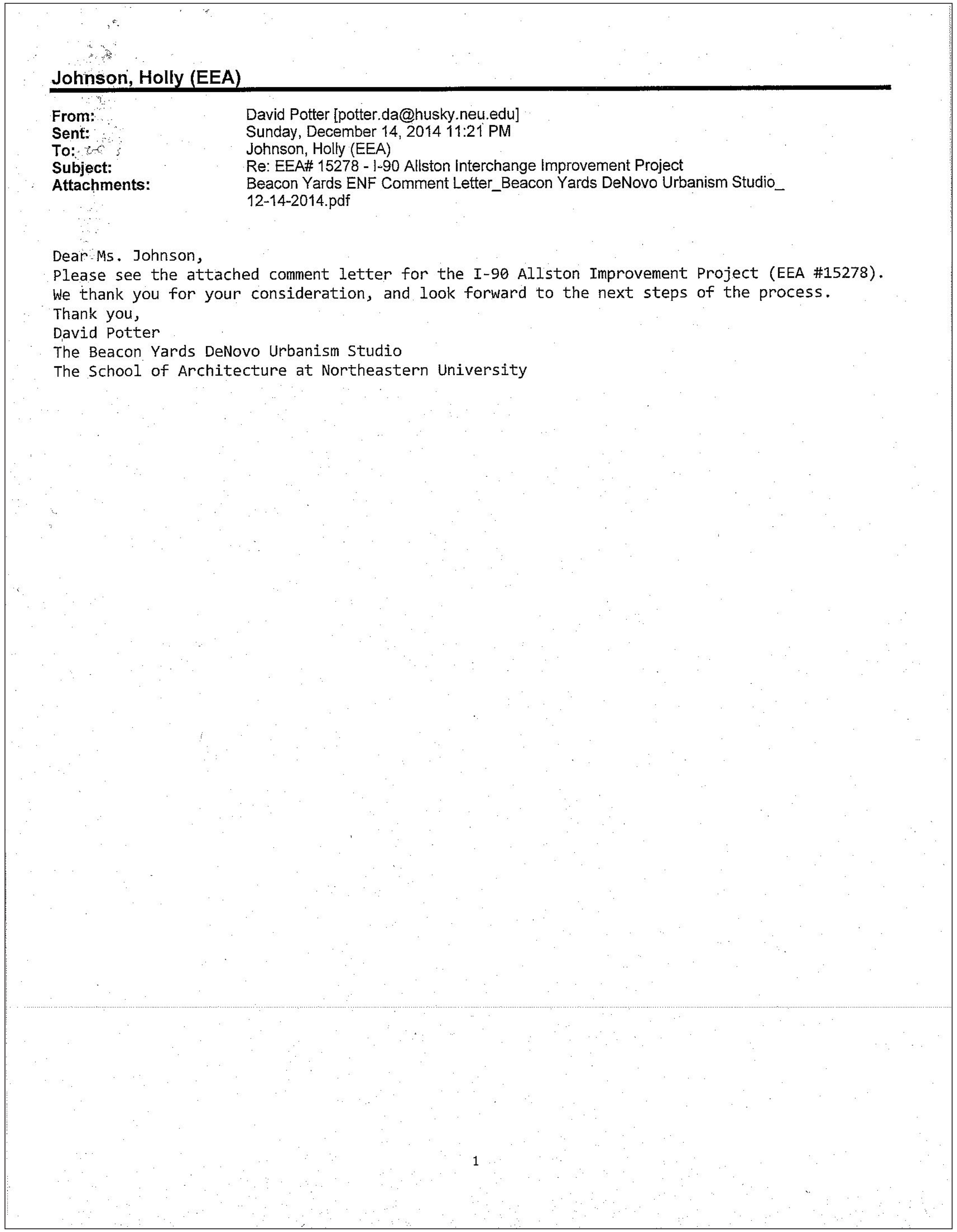
Thank you for your attention to this matter.



Sincerely,

Laura S. Kershner
97 Henry Street
Cambridge, MA 02139
(617) 547-6815
lskershner@aol.com

cc: james.cerbone@state.ma.us



Johnson, Holly (EEA)

From:	David Potter [potter.da@husky.neu.edu]
Sent:	Sunday, December 14, 2014 11:21 PM
To:	Johnson, Holly (EEA)
Subject:	Re: EEA# 15278 - I-90 Allston Interchange Improvement Project
Attachments:	Beacon Yards ENF Comment Letter_Beacon Yards DeNovo Urbanism Studio_ 12-14-2014.pdf

Dear Ms. Johnson,
Please see the attached comment letter for the I-90 Allston Improvement Project (EEA #15278).
We thank you for your consideration, and look forward to the next steps of the process.
Thank you,
David Potter
The Beacon Yards DeNovo Urbanism Studio
The School of Architecture at Northeastern University

Working as urban-designers outside the scope of the MassDOT project has enabled us to tackle the study of larger transportation connections and their consequences in response to real estate development, place-making opportunities, environmental policy, and the history of Beacon Yards - in addition to the transportation infrastructure. As a function of this research, we have recommended an integrated stormwater approach, open space network, development parcels plan, and a complete streets network. We have showcased these approaches within our comprehensive Beacon Yards master plan available here:

http://issuu.com/neuarchitecture/docs/2014.12.12_beacon-yards_master_fina

Please refer to the attached master plan (figure 1) that showcases one potential scenario as the outcome of our design research. In addition, you will find an aerial perspective (figure 2) that showcases the connections to a future West Station designed according to the principles above. To address the breadth of the MassDOT proposal, we have included phasing diagrams which limit the initial build out to a comparable scope (reference figure 3). In this way, our test-fit gives credence both to the transportation logic of the MassDOT proposal and to the areas identified for additional study, and showcases our interest in the complexities and interdependences of this project, as showcased by the integration of stormwater systems, block structure, detailed street guidelines, and pedestrian access (figure 4).

While we do not suggest that this plan is fully considered in terms of technical issues, we have put forth our efforts to better inform the interdependencies of transportation networks, real-estate development, and the future build-out of Beacon Yards. We hope our comments and proposal provide productive guidance, and look forward to the next steps in the process.

Sincerely,

The Beacon Yards DeNovo Urbanism Studio:
Jimmy Chao, Zoe Cloonan, Karen Hilario, Kelsey Holmes, Meaghan Hutchins, Linda Ly, David Potter, Joseph Pucci, Matthew Rowan, and Brian Vieira

The School of Architecture at Northeastern University
151 Ryder Hall
Boston, MA 02115

Cc: MassDOT Highway Division, Environmental Services Section
Attn: James Cerbone
10 Park Plaza, Room 4260, Boston, MA 02116
James.Cerbone@state.ma.us

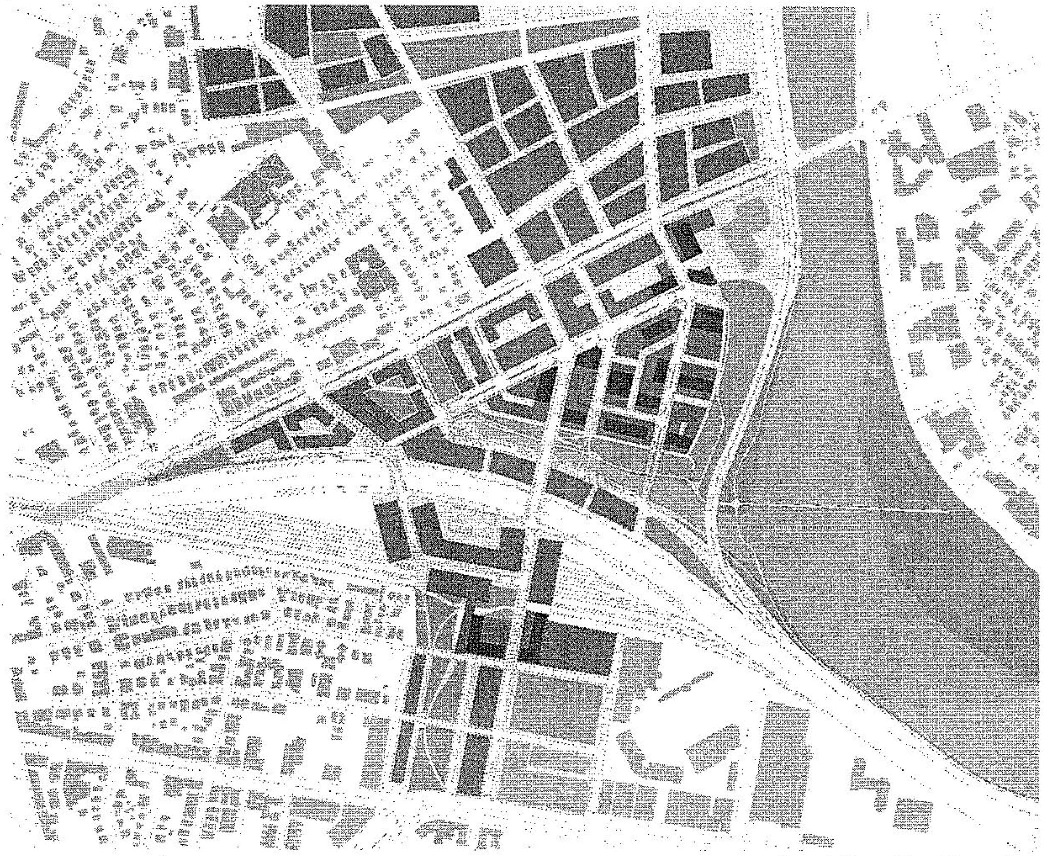


Figure 1: Master Plan of Beacon Yards
Highlights comprehensive strategy –
Integration of Harvard University IMP and BU master planning

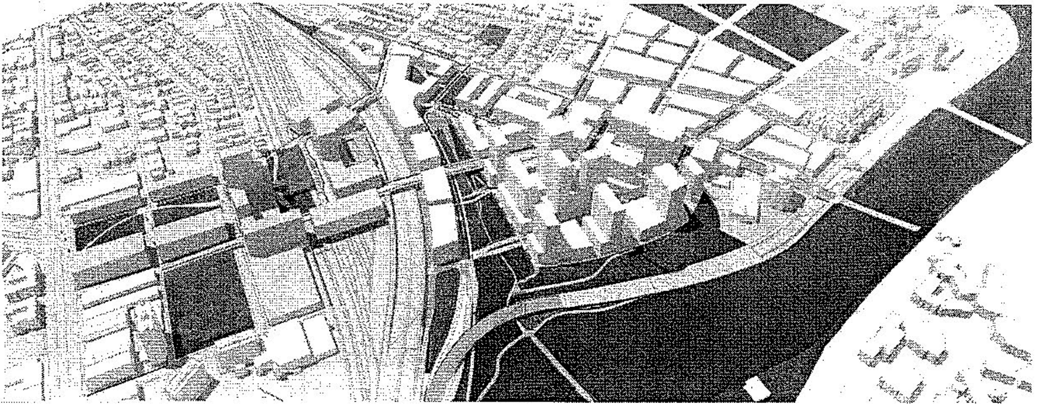


Figure 2: Aerial View of Beacon Yards
Connections to West Station (shown here in copper)

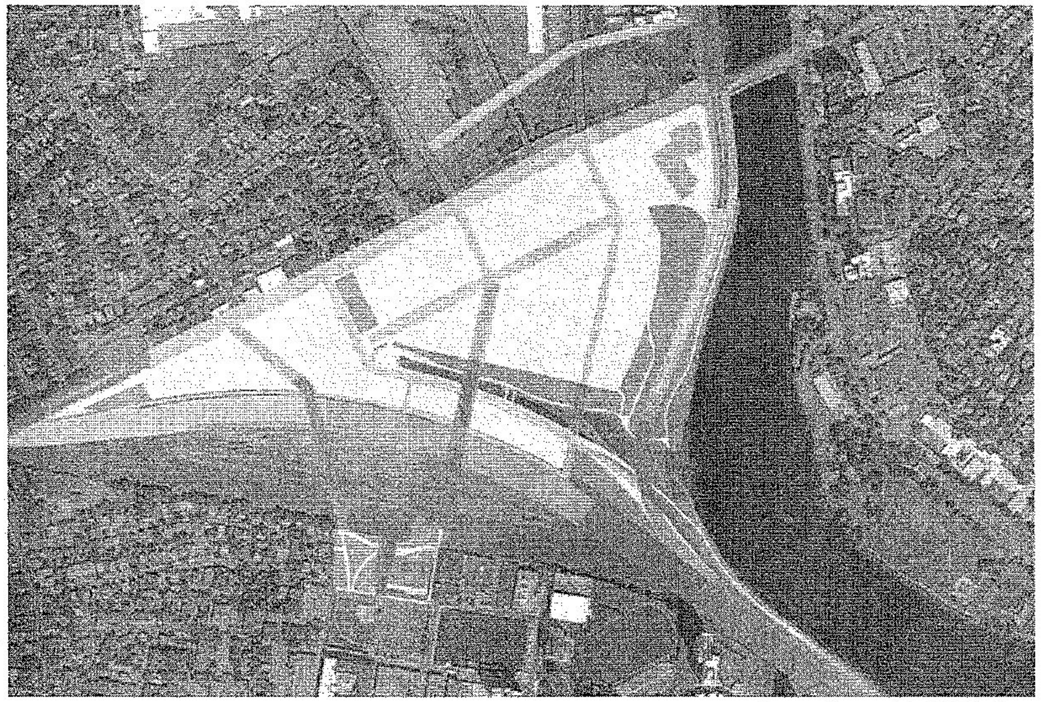


Figure 3: Phase 1 – MassDOT build-out
Comparable scope to MassDOT proposal

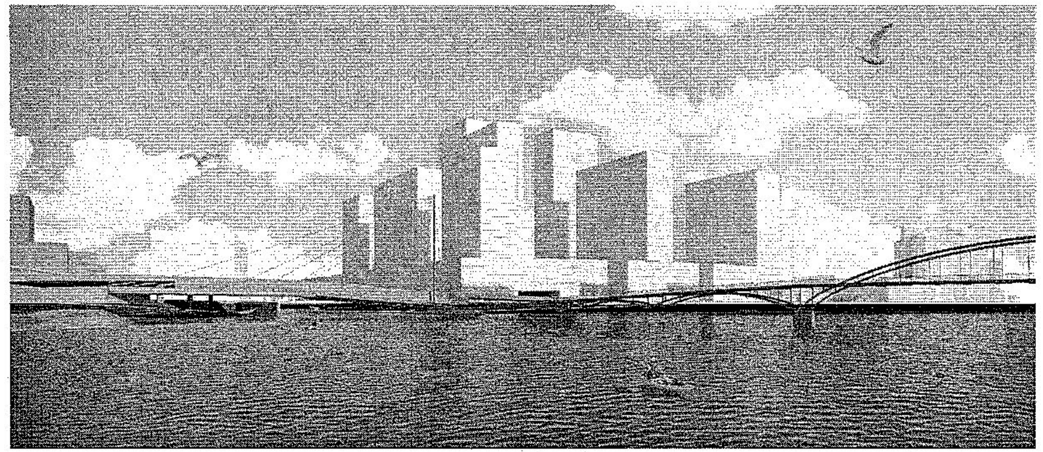
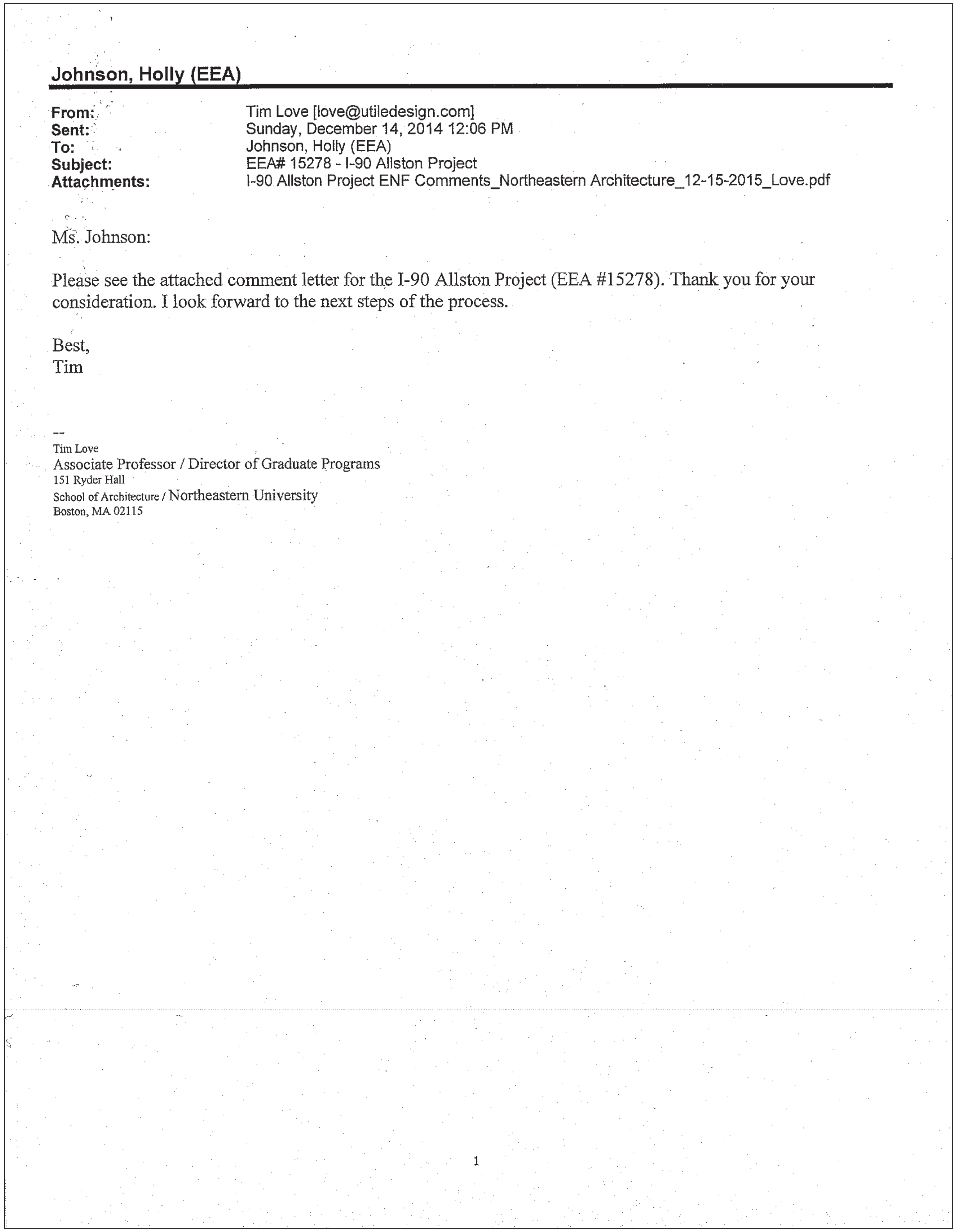


Figure 4: Rendered View from Charles River
Showcases integrated stormwater strategy, parcel delineation, and pedestrian connections to Cambridgeport and to Boston leveraging the existing Paul Dudley White Path

SCHOOL OF ARCHITECTURE
Northeastern University
College of Arts, Media and Design



Johnson, Holly (EEA)

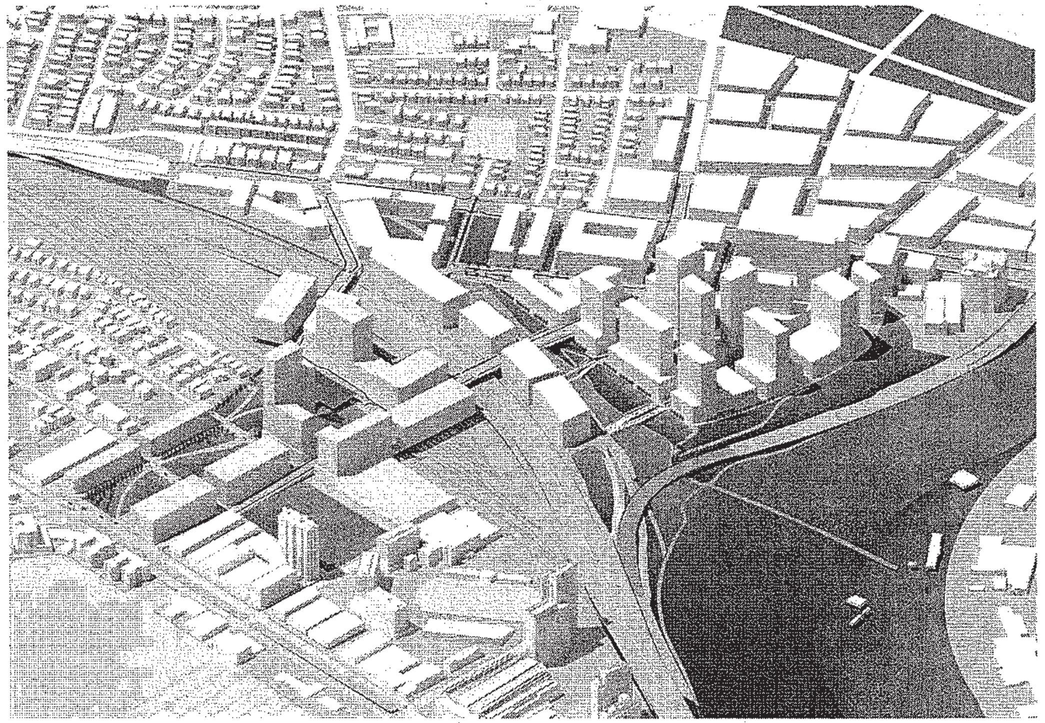
From: Tim Love [love@utiledesign.com]
Sent: Sunday, December 14, 2014 12:06 PM
To: Johnson, Holly (EEA)
Subject: EEA# 15278 - I-90 Allston Project
Attachments: I-90 Allston Project ENF Comments_Northeastern Architecture_12-15-2015_Love.pdf

Ms. Johnson:

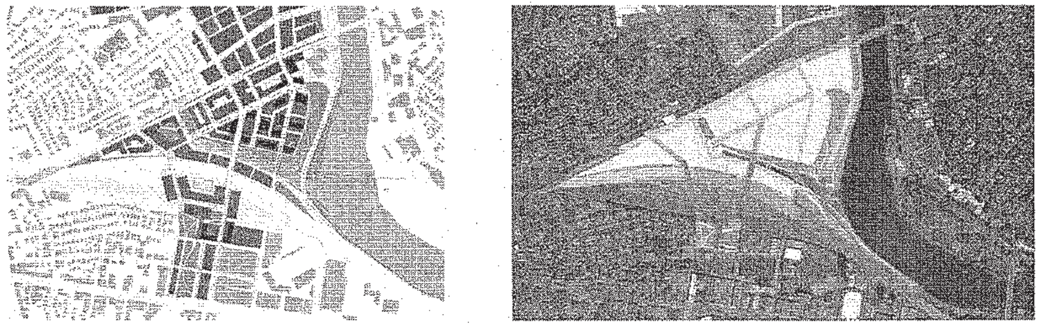
Please see the attached comment letter for the I-90 Allston Project (EEA #15278). Thank you for your consideration. I look forward to the next steps of the process.

Best,
Tim

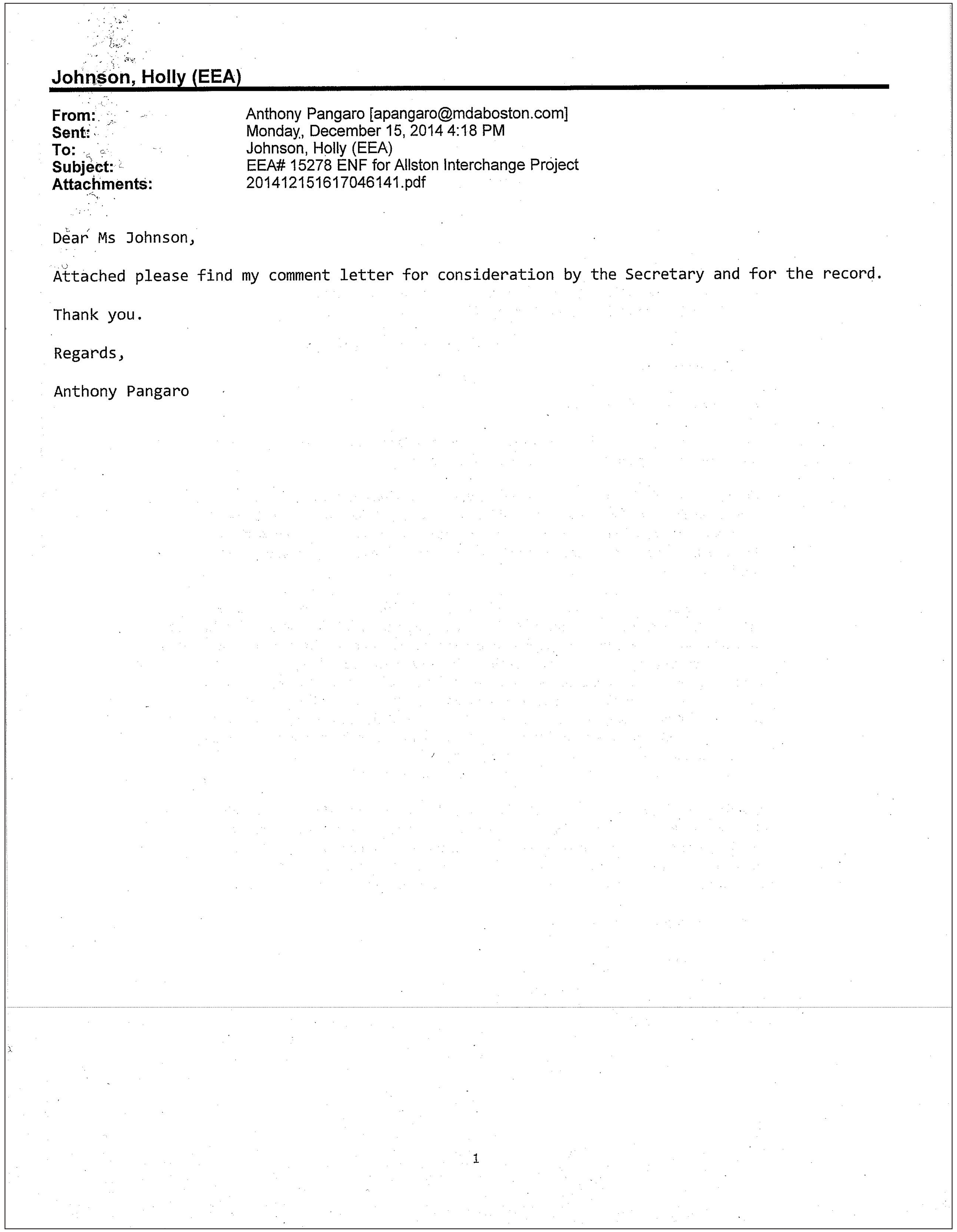
--
Tim Love
Associate Professor / Director of Graduate Programs
151 Ryder Hall
School of Architecture / Northeastern University
Boston, MA 02115



Overview of the Master Plan prepared by the Northeastern University School of Architecture Graduate Research Studio



The full Master Plan compared to a recommended first phase MassDOT project



Johnson, Holly (EEA)

From: Anthony Pangaro [apangaro@mdaboston.com]
Sent: Monday, December 15, 2014 4:18 PM
To: Johnson, Holly (EEA)
Subject: EEA# 15278 ENF for Allston Interchange Project
Attachments: 201412151617046141.pdf

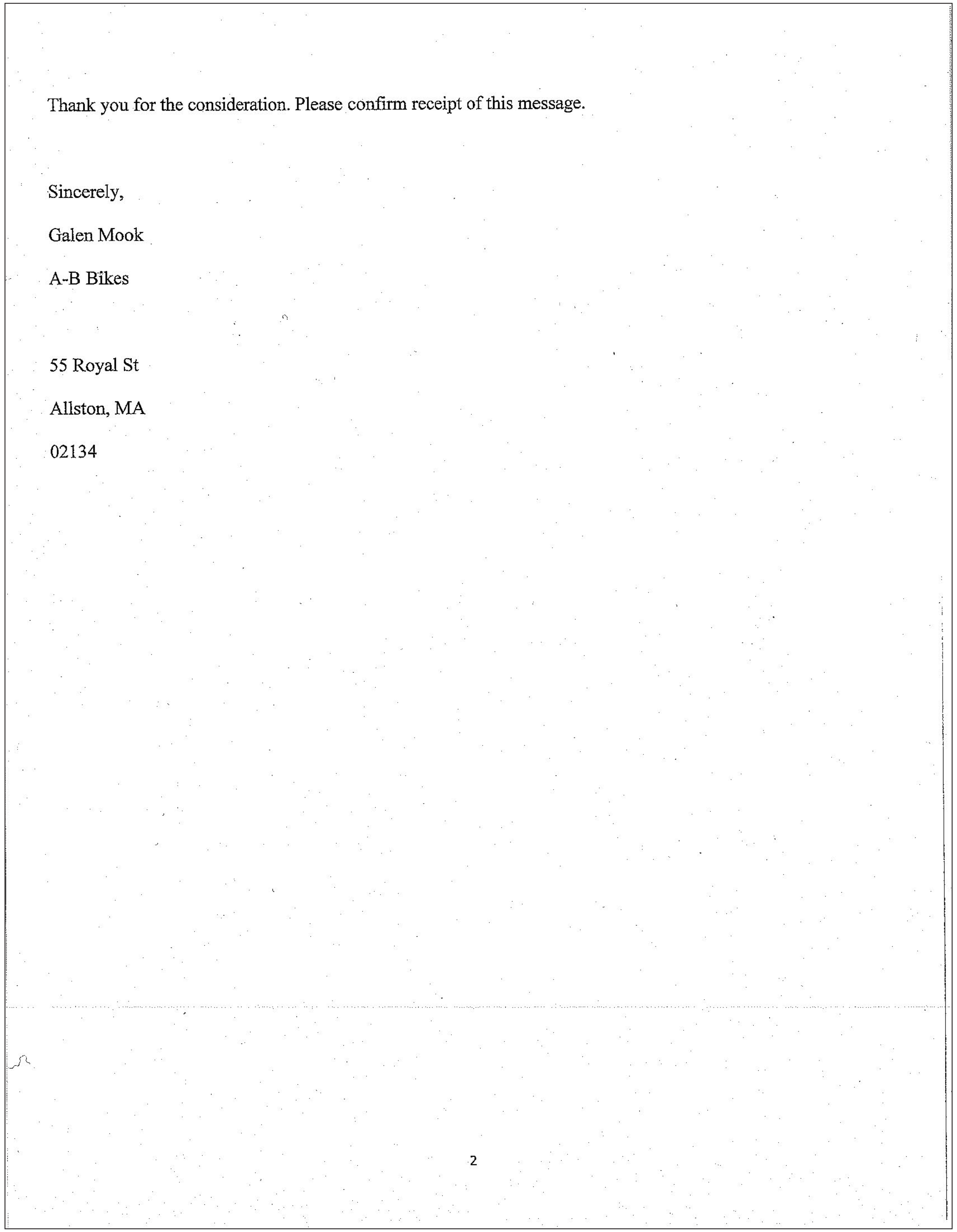
Dear Ms Johnson,

Attached please find my comment letter for consideration by the Secretary and for the record.

Thank you.

Regards,

Anthony Pangaro



Thank you for the consideration. Please confirm receipt of this message.

Sincerely,

Galen Mook

A-B Bikes

55 Royal St

Allston, MA

02134

December 15, 2014

Secretary Maeve Vallely Bartlett
Executive Office of Energy and Environmental Affairs
100 CambridgeSt., Suite 900
Boston MA 02114

RE:Comments on the Environmental Notification Form (ENF) for the MassDOT I-90 Allston Interchange Project
MEPA# 15278

Dear Secretary Bartlett:

Thank you for considering the many important issues that should be studied by the Massachusetts Department of Transportation in the development of its Draft Environmental Impact Report for the I-90 Allston Interchange Project. In addition to the many other important issues that your scope will include, we appreciate the opportunity to raise the following issues:

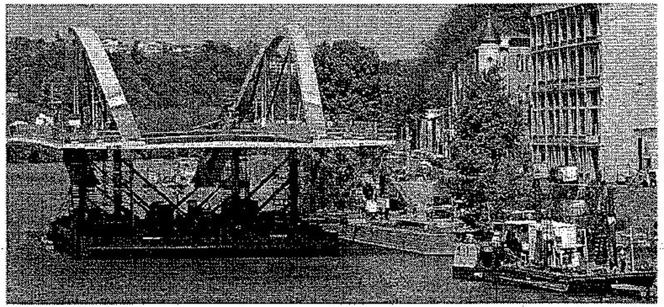
Replacement of the Grand Junction Rail Bridge
Impacts on the Pratt Street / Wadsworth Street Residential Neighborhood
Automobile Access between Commonwealth Ave and Mass Pike / Cambridge Street
Reducing cut-through traffic / "Local streets for local travel"
Bus Access to West Station
Construction of Stadium Way and East Drive
Viaduct Design and Construction Staging
Alternate sites for train storage
Soldiers Field Road modifications

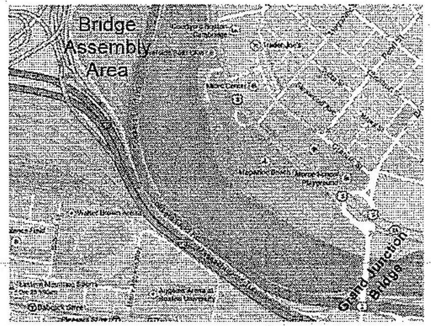
Replacement of the Grand Junction Rail Bridge

The Grand Junction Rail Bridge that passes under the BU Bridge is inexorably linked to goals of this project and goals of the City of Boston and Commonwealth of Massachusetts. The current bridge is:

1. In poor physical condition
2. A crucial link for rail service between the proposed West Station, Cambridge, and North Station
3. Well-situated to provide a bike/ped connection across the Charles River which would promote recreation, fitness, and mode shift towards commuting by bicycle.

Building on the success of MassDOT's highly successful "Fast 14" bridge replacement program[1], an opportunity exists for a similar replacement and upgrading of the Grand Junction Bridge. This could be done by assembling the new Grand Junction bridge structure in the unused railyard in the I-90 Allston Interchange Project area and then transporting it via barge the short distance to the Grand Junction site. This cost-effective approach would minimize down-time of the Grand Junction Bridge and would also be impossible to use at a later date when active uses occupy the empty site that could be used for assembly and staging. The construction of the Schuman Bridge in Lyon, France shown below is an example of this technique.[2] [3]





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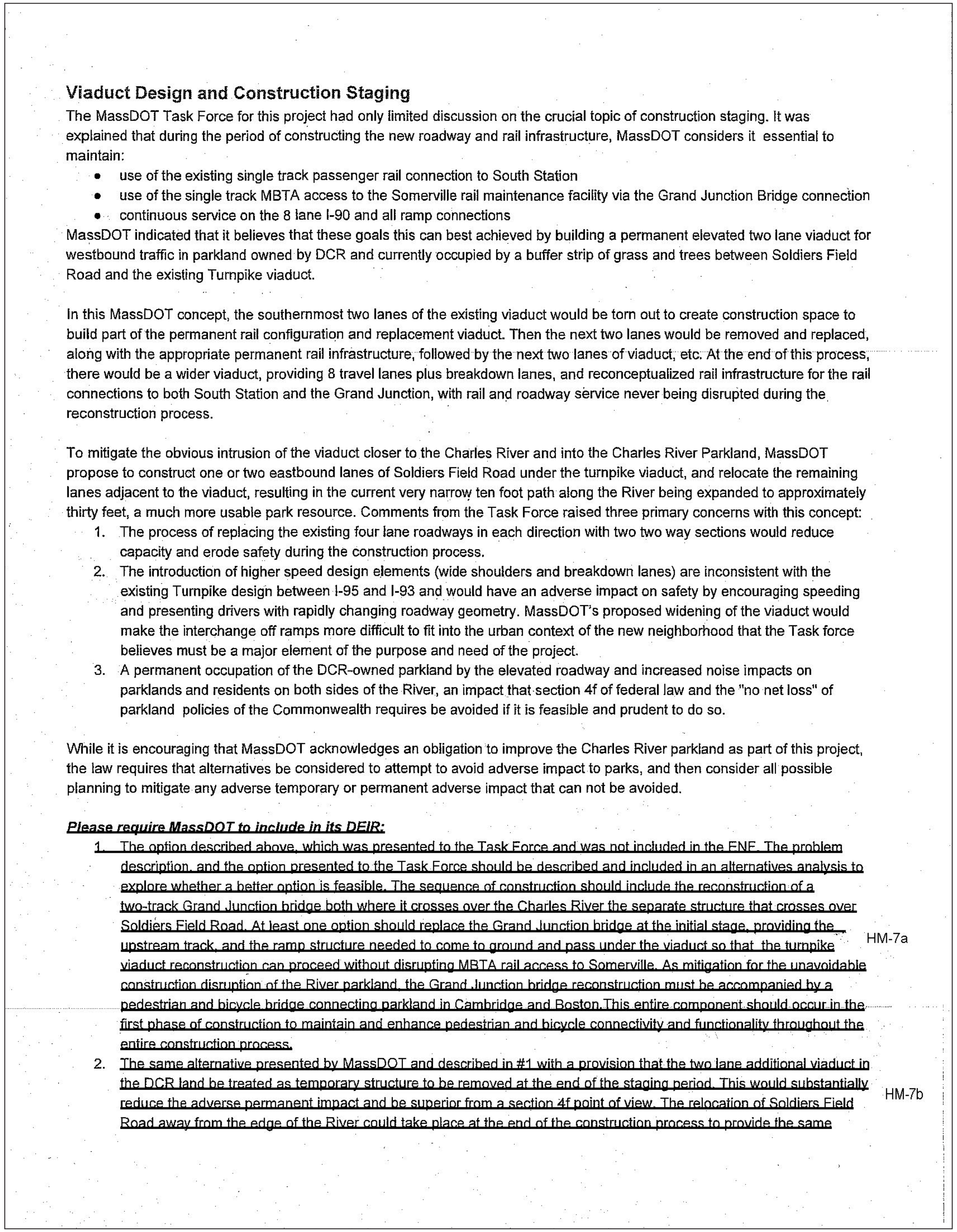
[1] http://www.massdot.state.ma.us/highway/HighlightedProjects/93Fast14RapidBridgeReplacementProject.aspx

[2] http://www.vinci.com/vinci.nsf/en/newsroom/pages/construction_of_the_schuman_bridge_in_lyon_france_102012.htm

[3] http://static4.demotix.com/sites/default/files/imagecache/a_scale_large/4400-2/photos/1397093116-last-preparation-before-first-part-of-schuman-bridge-installed--lyon_4428292.jpg



Viaduct Design and Construction Staging

The MassDOT Task Force for this project had only limited discussion on the crucial topic of construction staging. It was explained that during the period of constructing the new roadway and rail infrastructure, MassDOT considers it essential to maintain:

- use of the existing single track passenger rail connection to South Station
- use of the single track MBTA access to the Somerville rail maintenance facility via the Grand Junction Bridge connection
- continuous service on the 8 lane I-90 and all ramp connections

MassDOT indicated that it believes that these goals this can best achieved by building a permanent elevated two lane viaduct for westbound traffic in parkland owned by DCR and currently occupied by a buffer strip of grass and trees between Soldiers Field Road and the existing Turnpike viaduct.

In this MassDOT concept, the southernmost two lanes of the existing viaduct would be torn out to create construction space to build part of the permanent rail configuration and replacement viaduct. Then the next two lanes would be removed and replaced, along with the appropriate permanent rail infrastructure, followed by the next two lanes of viaduct, etc. At the end of this process, there would be a wider viaduct, providing 8 travel lanes plus breakdown lanes, and reconceptualized rail infrastructure for the rail connections to both South Station and the Grand Junction, with rail and roadway service never being disrupted during the reconstruction process.

To mitigate the obvious intrusion of the viaduct closer to the Charles River and into the Charles River Parkland, MassDOT propose to construct one or two eastbound lanes of Soldiers Field Road under the turnpike viaduct, and relocate the remaining lanes adjacent to the viaduct, resulting in the current very narrow ten foot path along the River being expanded to approximately thirty feet, a much more usable park resource. Comments from the Task Force raised three primary concerns with this concept:

1. The process of replacing the existing four lane roadways in each direction with two two way sections would reduce capacity and erode safety during the construction process.
2. The introduction of higher speed design elements (wide shoulders and breakdown lanes) are inconsistent with the existing Turnpike design between I-95 and I-93 and would have an adverse impact on safety by encouraging speeding and presenting drivers with rapidly changing roadway geometry. MassDOT's proposed widening of the viaduct would make the interchange off ramps more difficult to fit into the urban context of the new neighborhood that the Task force believes must be a major element of the purpose and need of the project.
3. A permanent occupation of the DCR-owned parkland by the elevated roadway and increased noise impacts on parklands and residents on both sides of the River, an impact that section 4f of federal law and the "no net loss" of parkland policies of the Commonwealth requires be avoided if it is feasible and prudent to do so.

While it is encouraging that MassDOT acknowledges an obligation to improve the Charles River parkland as part of this project, the law requires that alternatives be considered to attempt to avoid adverse impact to parks, and then consider all possible planning to mitigate any adverse temporary or permanent adverse impact that can not be avoided.

Please require MassDOT to include in its DEIR:

1. The option described above, which was presented to the Task Force and was not included in the ENF. The problem description, and the option presented to the Task Force should be described and included in an alternatives analysis to explore whether a better option is feasible. The sequence of construction should include the reconstruction of a two-track Grand Junction bridge both where it crosses over the Charles River the separate structure that crosses over Soldiers Field Road. At least one option should replace the Grand Junction bridge at the initial stage, providing the upstream track, and the ramp structure needed to come to ground and pass under the viaduct so that the turnpike viaduct reconstruction can proceed without disrupting MBTA rail access to Somerville. As mitigation for the unavoidable construction disruption of the River parkland, the Grand Junction bridge reconstruction must be accompanied by a pedestrian and bicycle bridge connecting parkland in Cambridge and Boston.This entire component should occur in the first phase of construction to maintain and enhance pedestrian and bicycle connectivity and functionality throughout the entire construction process. HM-7a
2. The same alternative presented by MassDOT and described in #1 with a provision that the two lane additional viaduct in the DCR land be treated as temporary structure to be removed at the end of the staging period. This would substantially reduce the adverse permanent impact and be superior from a section 4f point of view. The relocation of Soldiers Field Road away from the edge of the River could take place at the end of the construction process to provide the same HM-7b

widening of the River parkland without the complexity of locating Soldiers Field road under the viaduct. This improvement in the River parkland would serve to mitigate the temporary intrusion into parkland. Moreover, if it is recognized that MassDOT is currently operating this section of the Mass Pike with 3 lanes each way (to enable construction related to the Commonwealth Ave overpass) and the performance of the traffic is no worse than at several other points in the road, the construction could be expedited by letting the northerly 6 lanes operate as a two way temporary viaduct while removing the southerly 4 lanes, allowing much more generous construction zones. This approach would have the added benefit of locating the new rail and viaduct at somewhat lower profiles, both to recognize the likely need to remove contaminated earth, and the desirability of a somewhat lower profile. MEPA should require that MassDOT develop this alternative as a means to avoid all or most permanent adverse impact, as required by law. This approach would also have less adverse impact on traffic during construction, and therefore result in less spillover traffic onto neighborhood streets. HM-7b (Cont.)

3. An alternative with the westbound lanes of the Turnpike permanently at grade to reduce impacts and mitigate the apparently inevitable temporary construction period use of the DCR land. HM-7c
4. An alternative that utilizes the space under the existing viaduct to accommodate one of the temporary detours, and thereby avoid even construction period adverse impact on the DCR land. HM-7d

Only by publicly exploring these and possible other alternatives can the law be complied with, and an optimum value outcome achieved.

Alternate sites for train storage

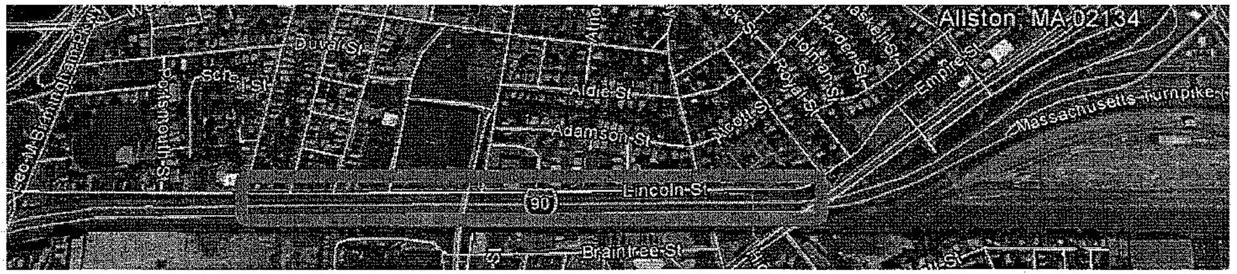
Immediately to the west of the project site, between the Litchfield Street and Harvard Ave, there exists a 2,800 foot long stretch of four rail lines, only one of which appears to be actively used. West of Litchfield Street there are only two tracks, which suggests that the additional two tracks between Litchfield and Harvard Ave have minimal or no utility for active train service.

Additionally, MassDOT's South Station Expansion Draft EIR includes Widett Circle as an added location for layup facilities. Widett Circle is

- Much further from residential property
- Much closer to South Station
- Potentially available much sooner than Allston because Widett Circle is not subject to the several years of construction that the Allston interchange will take to redevelop,
- Less vulnerable to the complexities of signal interlocking and track work that will need to accompany South Station
- Not subject to the track constraints of the Allston site which is on the wrong end of a single track

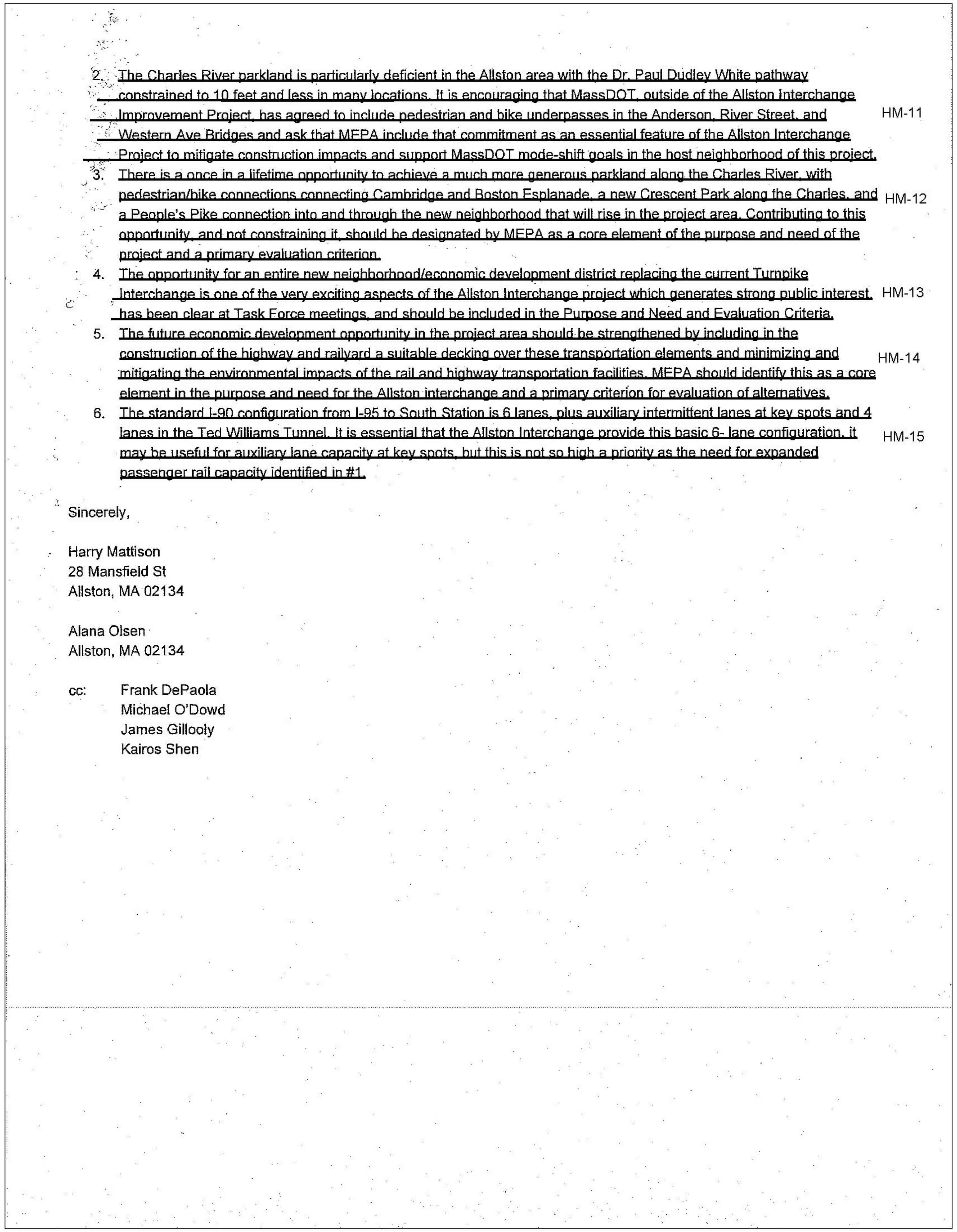
It is desirable to reduce the amount of valuable land in the Alston project area used for train storage. This would allow additional straightening of the Mass Pike, increase the economic development potential in the project area, and simplify north-south road connections over the railyard.

Please require MassDOT to study the potential for both Widett Circle and the four-track space between Litchfield Street and Harvard Ave to be used for rail storage and reduce the acreage in the project area proposed for rail storage. HM-8



Soldiers Field Road modifications

MassDOT has proposed allowing traffic from the Pike to access eastbound Soldiers Field Road via a new connection parallel to and south of Cambridge Street. This will allow a high volume of cars to avoid using Cambridge Street and the congested



2. The Charles River parkland is particularly deficient in the Allston area with the Dr. Paul Dudley White pathway constrained to 10 feet and less in many locations. It is encouraging that MassDOT, outside of the Allston Interchange Improvement Project, has agreed to include pedestrian and bike underpasses in the Anderson, River Street, and Western Ave Bridges and ask that MEPA include that commitment as an essential feature of the Allston Interchange Project to mitigate construction impacts and support MassDOT mode-shift goals in the host neighborhood of this project. HM-11
3. There is a once in a lifetime opportunity to achieve a much more generous parkland along the Charles River, with pedestrian/bike connections connecting Cambridge and Boston Esplanade, a new Crescent Park along the Charles, and a People's Pike connection into and through the new neighborhood that will rise in the project area. Contributing to this opportunity, and not constraining it, should be designated by MEPA as a core element of the purpose and need of the project and a primary evaluation criterion. HM-12
4. The opportunity for an entire new neighborhood/economic development district replacing the current Turnpike Interchange is one of the very exciting aspects of the Allston Interchange project which generates strong public interest, has been clear at Task Force meetings, and should be included in the Purpose and Need and Evaluation Criteria. HM-13
5. The future economic development opportunity in the project area should be strengthened by including in the construction of the highway and railyard a suitable decking over these transportation elements and minimizing and mitigating the environmental impacts of the rail and highway transportation facilities. MEPA should identify this as a core element in the purpose and need for the Allston interchange and a primary criterion for evaluation of alternatives. HM-14
6. The standard I-90 configuration from I-95 to South Station is 6 lanes, plus auxiliary intermittent lanes at key spots and 4 lanes in the Ted Williams Tunnel. It is essential that the Allston Interchange provide this basic 6- lane configuration, it may be useful for auxiliary lane capacity at key spots, but this is not so high a priority as the need for expanded passenger rail capacity identified in #1. HM-15

Sincerely,

Harry Mattison
28 Mansfield St
Allston, MA 02134

Alana Olsen
Allston, MA 02134

cc: Frank DePaola
Michael O'Dowd
James Gillooly
Kairos Shen

Conducted by Tim Love, Alan Mountjoy, Alex Krieger, and Kishore Varanasi

Krieger/Mountjoy Team
Alex Krieger, Alan Mountjoy, Kelly Lynema, Pablo Licari, Kevin Conant, Harry Mattison, Herb Nolan, Cynthia Smith, Wileen Kao, Conor Semler, Alex Davis, Scott Turner

Varanasi Team
Kishore Varanasi, Ganesh Ramachandran, Kristina Ricco, Yichin Zhu, Matt Urbanski, Chris Matthews, Kyle Jonasen, Jason Schrieber

Organizing Committee
Tim Love and Gretchen Schneider

Advisory Committee
Mike Davis, Rick Dimino, and Eric White

Panel Discussion Participants
Renée Loth, Paul McMorrow, Matthew Urbanski, Gary Hilderbrand, Scott Paige Reed, and Tim Love

BSA

Beacon Yards Urban Design Workshop

The Beacon Yards Charrette

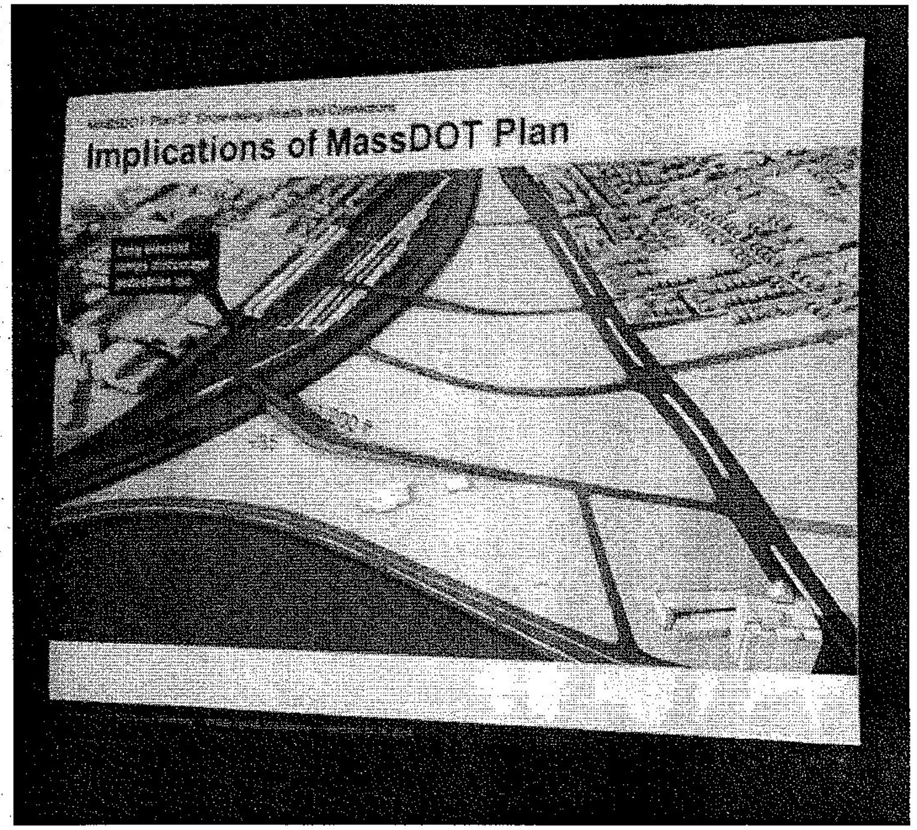
To launch the Urban Design Workshop program, the BSA hosted a two-day urban design charrette on September 17 and 18 that focused on the urban design issues raised by MassDOT's proposal for the redesign of the Allston/Cambridge interchange.

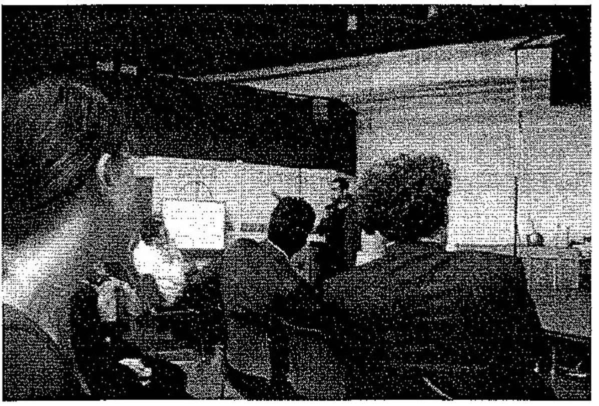
The charrette was organized by Tim Love, the BSA President-elect.

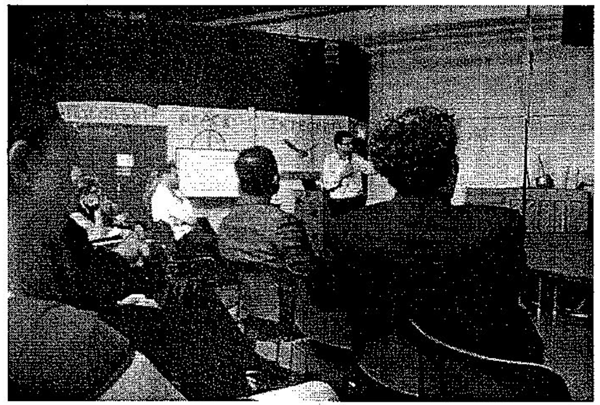
To set the stage for the charrette, Renee Loth, editor of ArchitectureBoston magazine, moderated a panel discussion on the evening of September 16. Tim Love introduced the scope and goals of the charrette and provided background information on MassDOT's ongoing process. After the presentation, Loth engaged Gary Hilderbrand, landscape architect at Reed Hilderbrand Associates; Matthew Urbanski, a landscape architect at MVVA; Paige Scott Reed, MassDOT's General Counsel, and Paul McMorrow, Associate Editor of Commonwealth Magazine and a contributor to the Boston Globe, in a lively discussion.

Two interdisciplinary urban design teams, led by Alex Krieger and Alan Mountjoy of NBBJ and Kishore Varanasi of CBT Architects, each produced urban design visions for the Beacon Yards site that fully leveraged the city building opportunities of the MassDOT interchange project. In addition to architects and urban designers, the teams included transportation planners and landscape architects enlisted through the efforts of the BSA Urban Design Committee.

Each team was provided with the same background information, layered maps, and a digital model. Teams got to work on the morning of Wednesday, September 17 and their proposals were unveiled at 4:00pm on Thursday, September 18 at a BSA-hosted public meeting at the Jackson Mann Community Center in Allston, near the Beacon Yards parcel. The proposals included a street and open space network, suggestions for the configuration of real estate parcels, general building massing, and strategies for linking Boston University to Harvard and the Beacon Yards site to the Charles River.



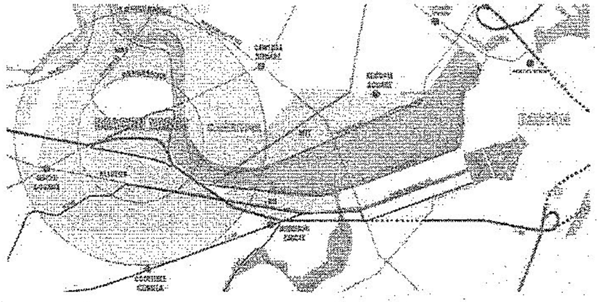




Above: A close-up of the public meeting presentation at the Jackson Mann Community Center.
Bottom left: Kishore Varanasi presents his team's scheme.
Bottom right: Alan Mountjoy presents his team's scheme.

Varanasi Team Proposal

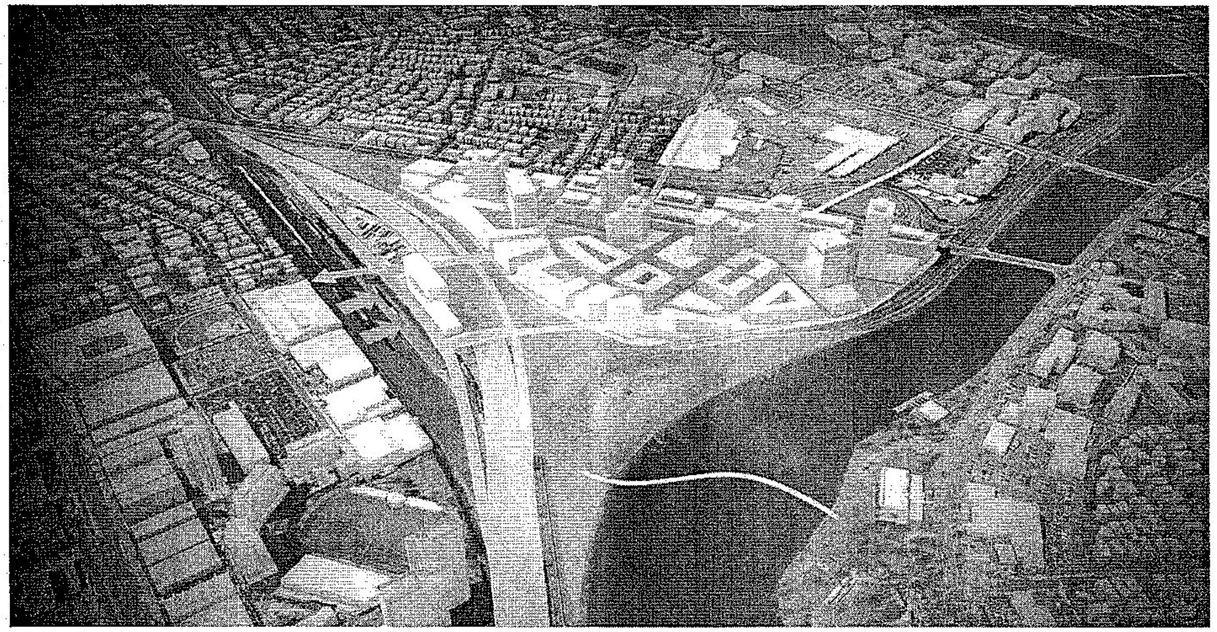
The Varanasi Team's urban design proposal embraces the idea that infrastructure is common ground and transforms it into a public realm asset.



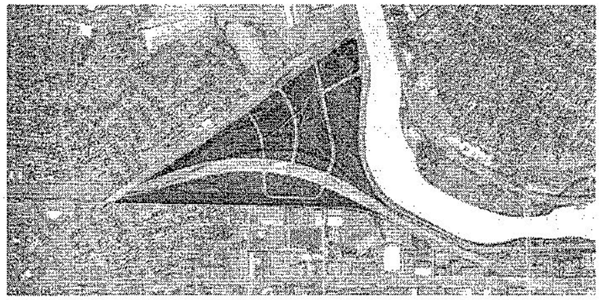
Beacon Yards is a piece of a bigger puzzle.

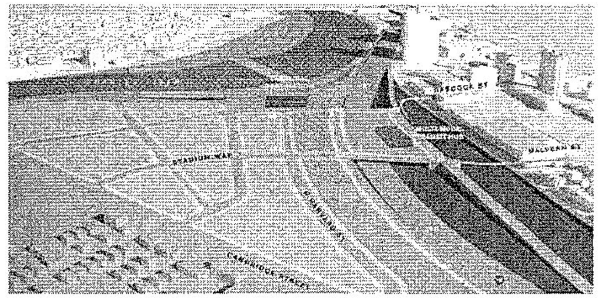
Keeping in mind the theme of 'living with infrastructure,' the scheme proposes an elevated linear public space along the realigned Massachusetts Turnpike and Rail Corridor. This raised space would become an important link between Lower Allston, the Charles River, the newly proposed West Station, Boston University, and Magazine Beach across the river in Cambridge. The open space would fit within a network which originates at the intersection of North Harvard Street and Cambridge Street, then follows the curve of the relocated turnpike, and which finally culminates in a dramatic overlook before dropping down to the Charles River. This robust network would be the early action investment in Beacon Yards that corresponds with the reconstruction of the turnpike. This results in direct pedestrian and bike connections both between the Lower Allston neighborhood and the Charles River pedestrian and bicycle path, and between Commonwealth Avenue and Beacon Yards along the north-south axis. The perceived ground plane of the new district is raised up enough that it follows the elevated roadways connecting the turnpike and West Station, so the open space network bridges over a relocated section of Soldiers' Field Road. In addition to serving as the primary place-making strategy for the proposal, the open space network adds value to the adjacent real estate parcels. Its orientation and organization provide value on all sides and great views toward the Boston skyline.

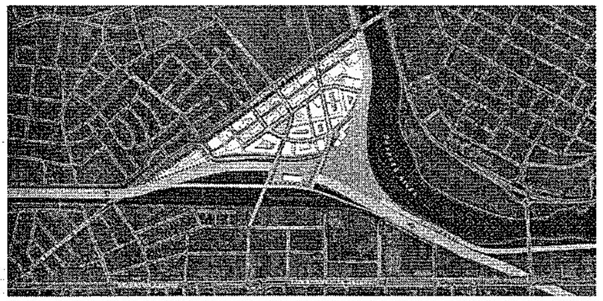
The Charles River Basin's open space does so much to define the image of both Boston and Cambridge, but it breaks down when Soldier's Field Road is squeezed close to the river at the Beacon Yards site. We propose transforming the public perception of Beacon Yards by creating generously-sized landmark open spaces that connect the neighborhoods and the Beacon Yards site to this pivotal and highly visible point on the river. This will accomplish for Beacon Yards what the Public Garden and Commonwealth Avenue did for the Back Bay. Despite its huge size, the site is currently hidden from view, and it is hard to place the area within the standard mental map of Boston. This open space could be called Beacon Common, and it would take its place alongside the world-class parks of Boston. More to the point, it would put Beacon Yards firmly on the map.



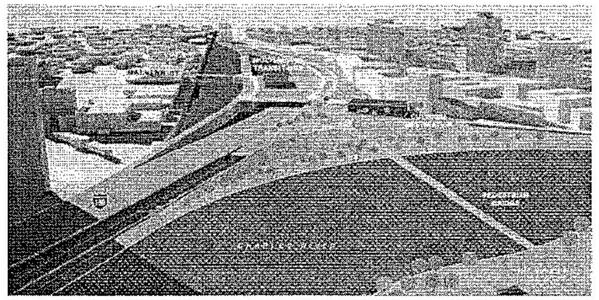
The project site has been entirely regarded to create a surface which meets the elevations of proposed on / off ramps. This new topography helps mediate the dramatic height required by the highway network and introduces a dramatic opportunity for public space.



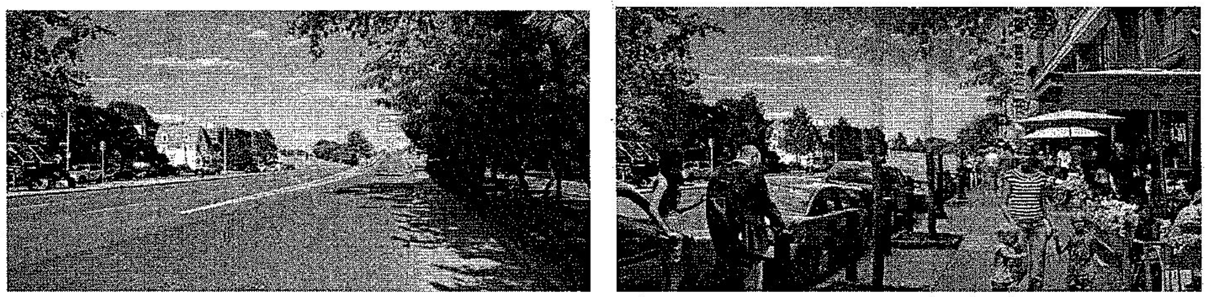




The Varanasi team's vision for Beacon Yards shifts elevated ramps west and makes connections across Cambridge Street to Stadium Way and the proposed East Drive. This scheme pulls highway traffic away from the Charles River without discharging it into adjacent residential neighborhoods.

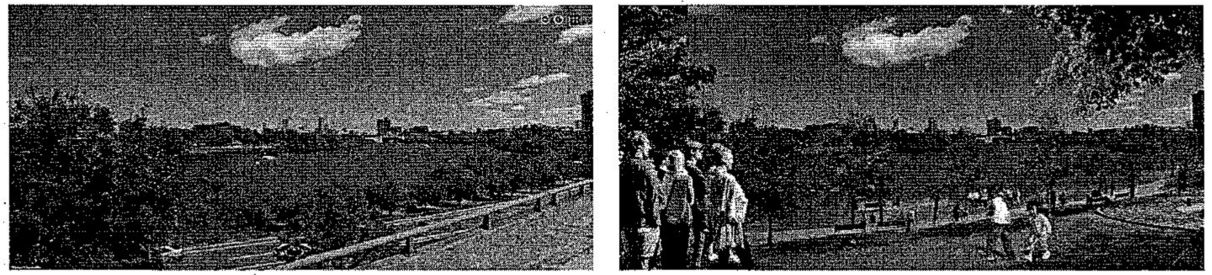


A continuous slope passes over the realigned Storrow Drive, connecting the Allston neighborhood directly to the river front.



Cambridge St: From a traffic arterial to a pedestrian-friendly Main Street

The introduction of a new network of streets across the Beacon Yards offers an ideal opportunity to reduce the number traffic lanes in Cambridge St and to return the street back to pedestrians. A mix of high-density uses fronting wider sidewalks provides a distinctive pedestrian-friendly transition between existing neighborhood to the west and the proposed development east of Cambridge St.



Beacon Commons: A new addition to Boston's open space network made possible by 'pulling-in' Storrow Drive away from the water, and carving out a public green space in direct connection to water. The open space negotiates the grade difference between the station plaza and the riverfront while at the same time offering a strategic opportunity to channel the remediation dollars from infrastructure interventions into a tangible public amenity.

Living with Infrastructure: Proposed pedestrian greenway and bike path rises alongside realigned turnpike providing direct pedestrian access from Allston neighborhoods. The greenway open up at the West Station plaza offering sweeping views of the City before gradually making its way down to the waterfront and the proposed public green, Beacon Commons.

Significant observations and considerations:

1. A major open space generates the first phase roadway network, instead of imagining that the planning process generates leftover spaces to be filled in as open space.
2. If we elevate the ground plane of future open spaces and abutting development, we can camouflage the true elevation of bermed roadways and bridges.
3. Moving the access ramps to I-90 further west will create a better urban network and allow for more public space along the Charles River.
4. The new West Station should sit closer to the realigned turnpike, so the residents on the south side will be better protected and so the station can engage with the public realm.
5. Soldier's Field Road should be pulled away from the river bank and concealed by a land bridge, which allows the new park land to descend uninterrupted to the river.
6. The open space runs along the line of the old Salt River, and this allows us to create wetland habitat at the point where the two rivers meet, which will unlock additional environmental and experiential benefits.
7. A significant residential component will create a truly public and mixed-use neighborhood and waterfront.

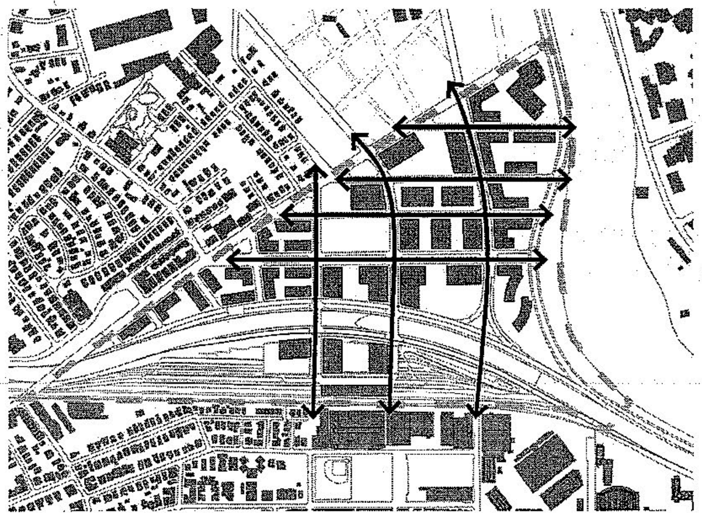
Krieger/Mountjoy Proposal

The Krieger/Mountjoy team's proposal capitalizes on the existing street grid to restore connectivity across the turnpike and to the river.

This team identified the following goals for future development over the existing railways and Turnpike:

- Reconnect across the "great divide" and ensure transit accessibility to the future West Station from the north and south.
- Improve connections to the Charles River and enhanced parkland condition at Soldiers Field Road.
- Maximize future development compatibility with Allston and Cambridge neighborhoods and with both Harvard and Boston University.

The proposal made several assumptions about existing conditions, such as predicting the future relocation of Houghton Chemical and the connecting rail spur that currently constrains the relocation of Soldiers Field Road. The proposal also assumes that future use of the Grand Junction alignment will accommodate both pedestrian and rail traffic and that Harvard will implement a network of streets north of Cambridge Street—such as Stadium Way and East Drive—which will connect the Beacon Yards site to Western Avenue.

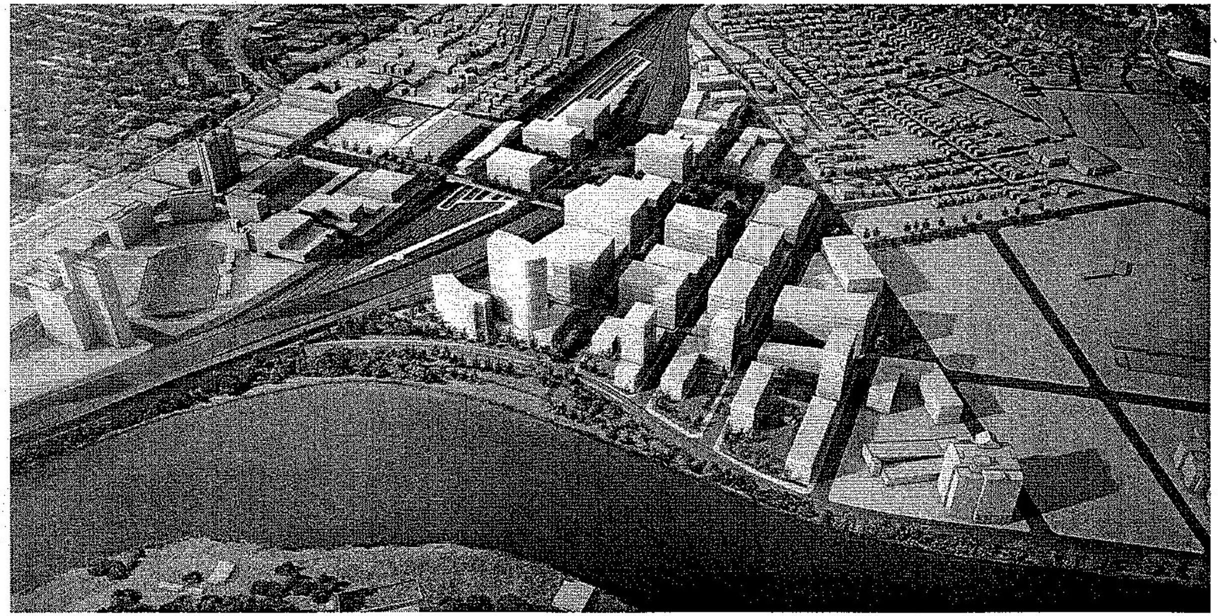


The Krieger/Mountjoy scheme responds to the existing street grid on both sides of the turnpike, allowing flexibility for long-term connectivity.

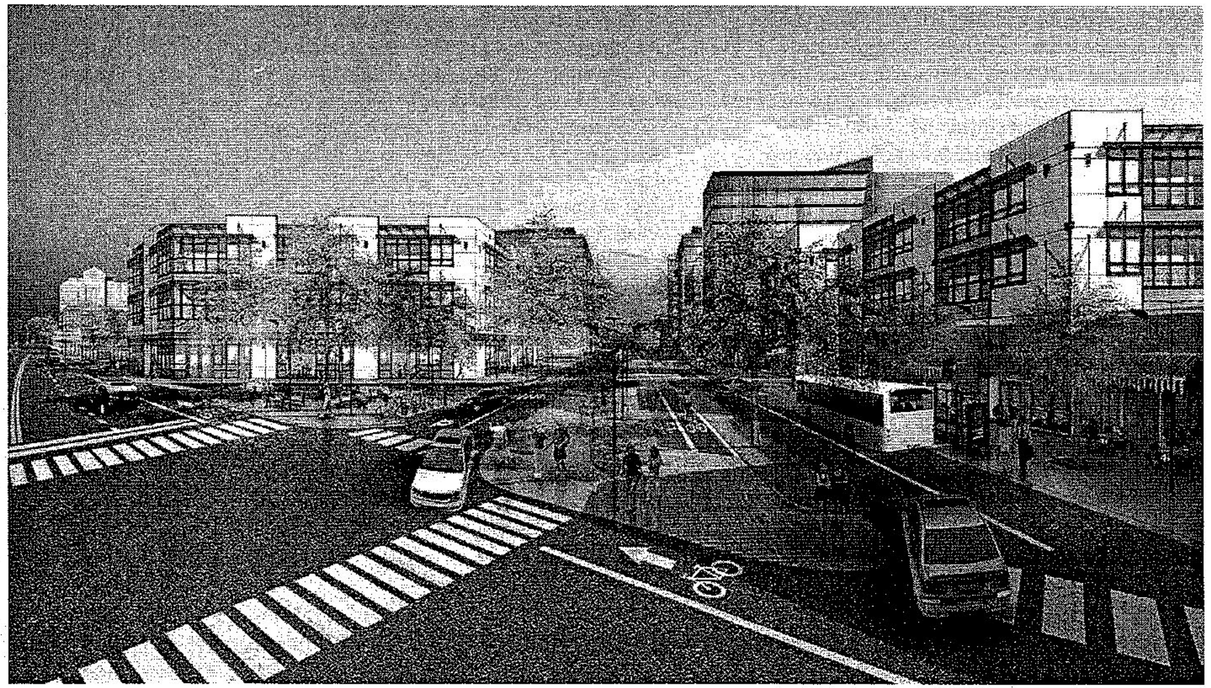
The team's starting point for design was the Option 3F plan, presented to the community on September 3, 2014. Subsequent plans have made slight modifications to this alternative, including a second, parallel Cambridge Street that will reduce the cross section of both streets. In the team's design proposal, they acknowledged the community desire for a "People's Pike" that would provide an off-road multi-use path through Beacon Yards to the Charles River and Cambridge beyond. The team also concluded that the 3F scheme did not fully support a walkable future, especially for those approaching West Station, nor did it adequately connect to the Charles River or to Boston University.

The Krieger/Mountjoy proposal has several key imperatives:

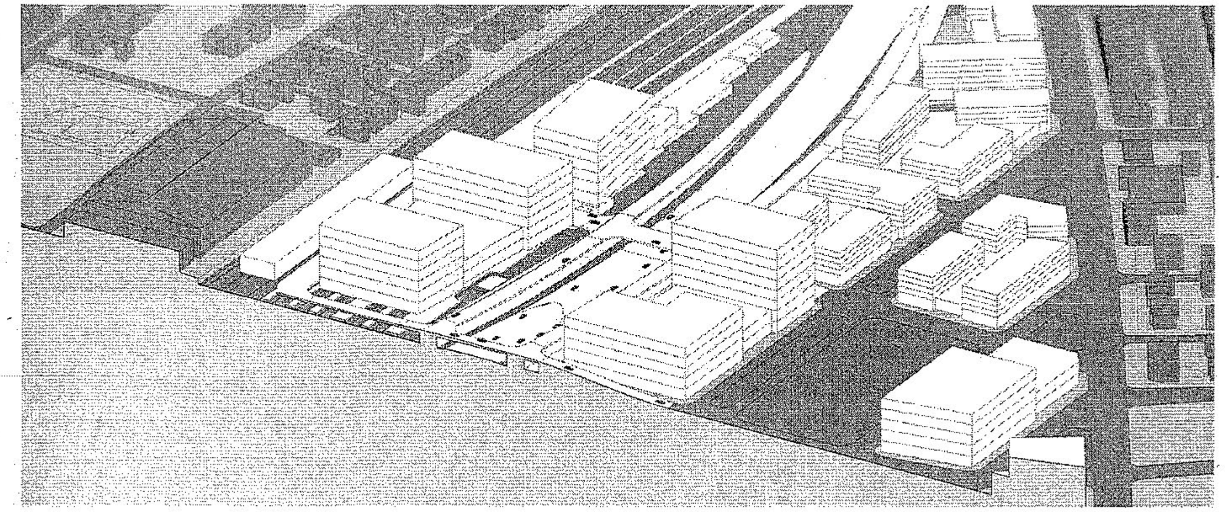
- The foremost imperative is to create a pedestrian-friendly network of streets that reconnect Lower Allston over the Turnpike and Beacon Yards to Boston University and Commonwealth Avenue. The team acknowledges that implementing this street network may take decades, but feels strongly that the current roadway and ramp construction should be compatible with this long range goal. Aligning new streets over Beacon Yards with existing streets such as Malvern and Alcorn would provide short-term legibility for pedestrians while allowing for long-term options for more connectivity over time.
- The second imperative is to improve connectivity from the Allston neighborhoods and Boston University to the Charles River. This would be achieved through a new network of east-west streets that lead directly to Soldiers Field Road perpendicular to the Charles River. This new street grid would provide both visual connectivity and support a pedestrian route leading from Harvard and Cambridge Streets to a pedestrian crossing to the Paul Dudley White Path either over or under Soldiers Field Road. A modified "People's Pike" could be accommodated in a single widened street resembling Commonwealth Avenue. This connection to the river should be combined with a realignment of Soldiers Field Road to expand the width of parklands along the Charles River.
- The third imperative is to scale the future development at Beacon Yards to relate to and enhance the existing neighborhoods, and to provide future developable parcels for a wide range of uses. The team has envisioned mixed-use and retail development scaled to the existing neighborhood fabric on the south side of Cambridge Street facing the Lower Allston residential neighborhoods near North Harvard Street. At the center of the site and adjacent to the Turnpike, they proposed larger parcels and taller buildings, suitable for commercial and research facilities associated with Harvard's proposed Enterprise Research Campus north of Cambridge Street. Adjacent to the Charles River, they recommended high-rise housing or hotels—similar to those nearby—that take advantage of the views and access to recreation that is afforded at this site.



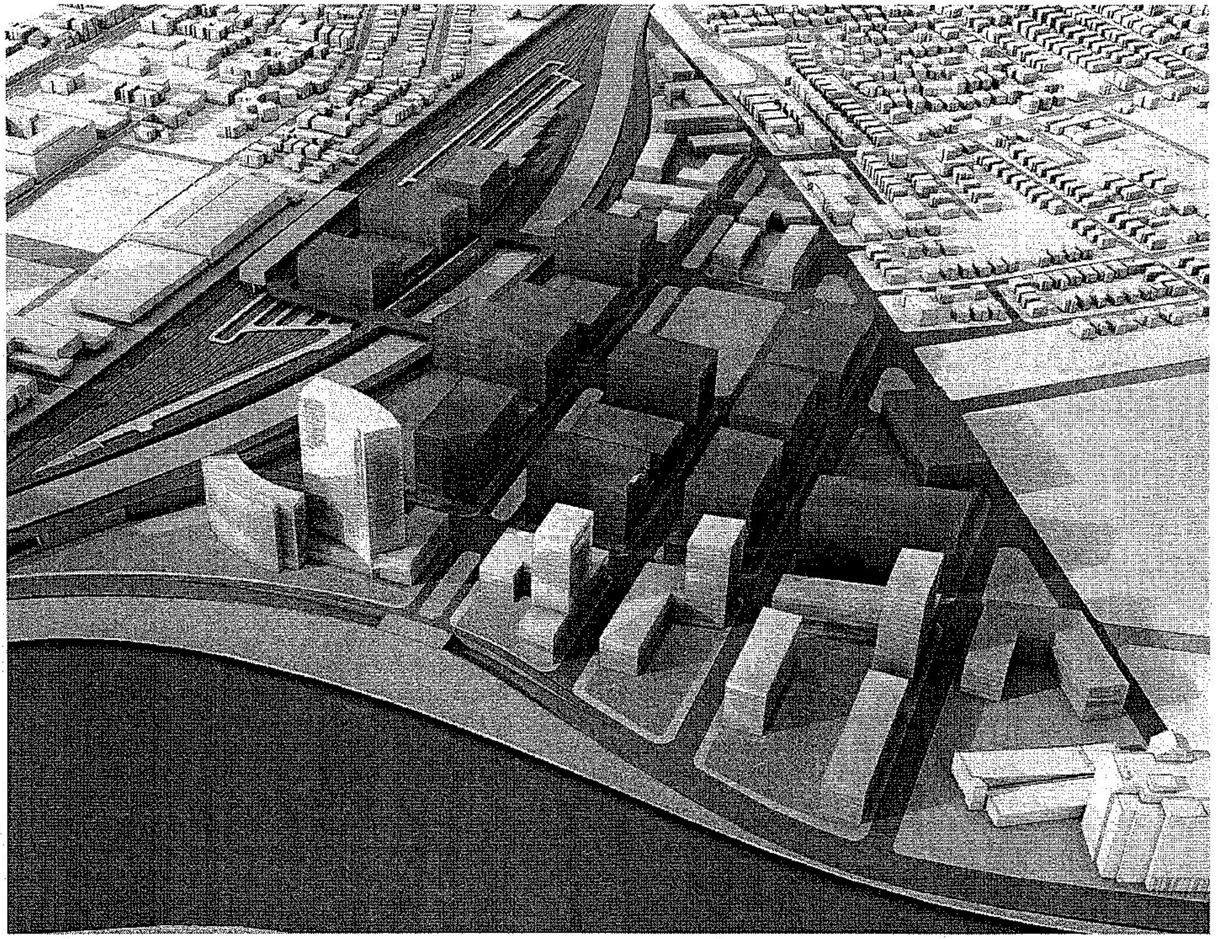
A view of the plan looking west; the team proposed increased open space along the Charles River and an orientation of the entire site toward the waterfront, with improved pedestrian accommodations across Soldier's Field Road and over the turnpike.



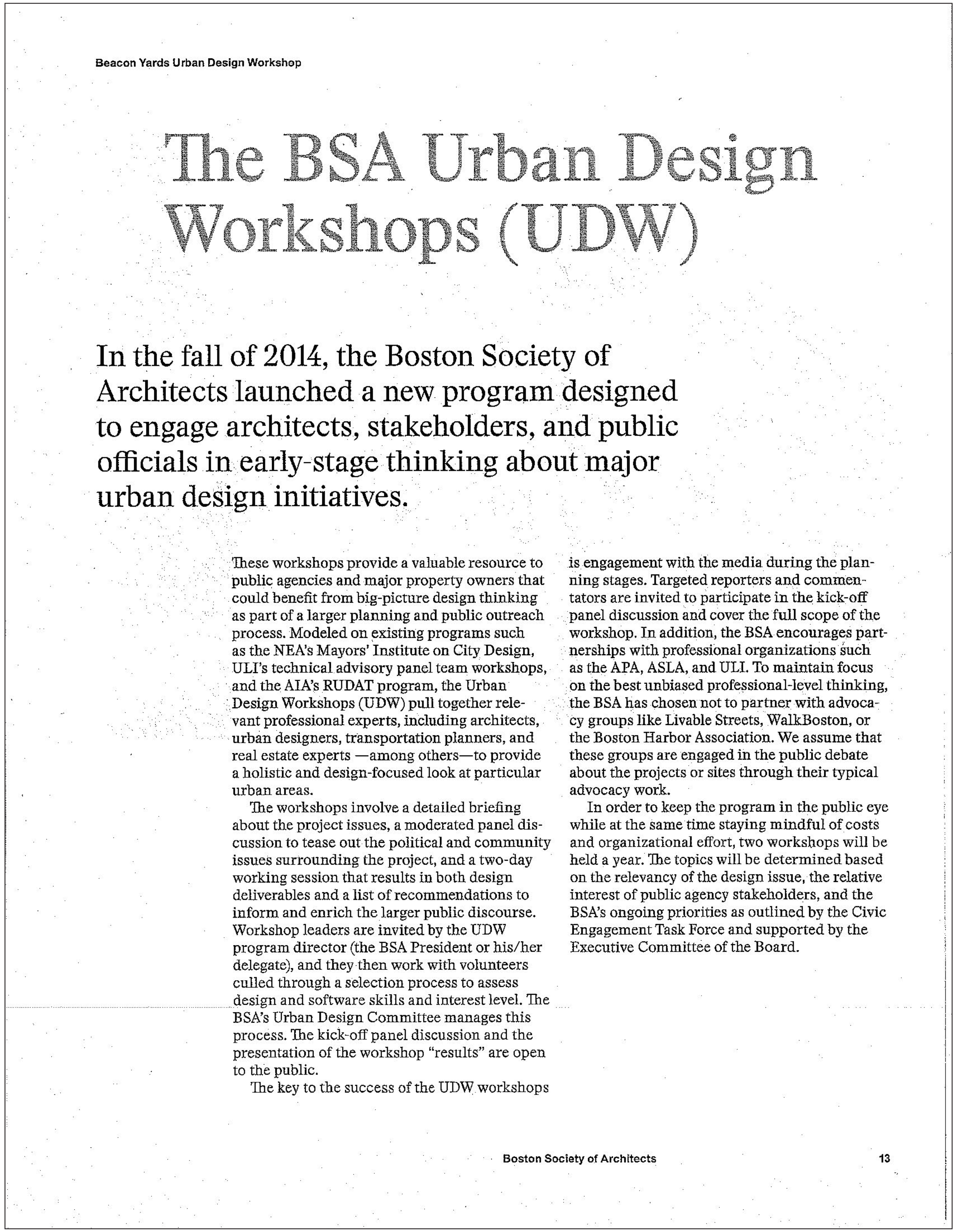
The scheme provides for views to the river from Charles Street, with a "People's Pike" promenade that connects pedestrians and cyclists to open space along the Charles River, the Paul Dudley White Path and beyond.



A section along Stadium Way intersecting the new West Station, possible air rights development, and a proposed neighborhood-serving park.



The proposed land use program for the Krieger/Mountjoy scheme responds to the existing context: housing and ground level retail are located adjacent to Allston's residential community; commercial and research buildings continue the fabric of Harvard's proposed Enterprise Research Campus; and residential and hotel uses line the parcels along the Charles River, taking advantage of views to downtown Boston.



The BSA Urban Design Workshops (UDW)

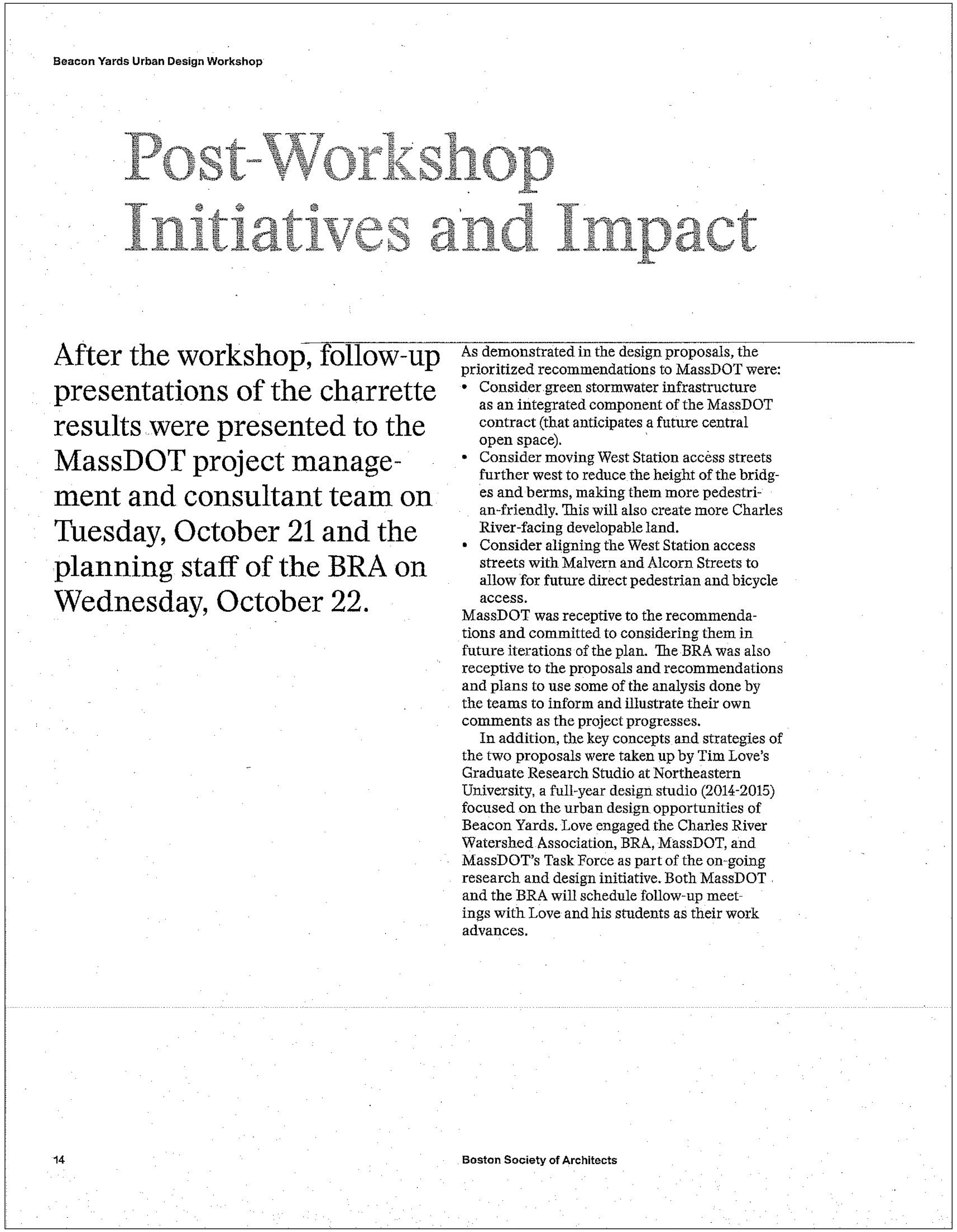
In the fall of 2014, the Boston Society of Architects launched a new program designed to engage architects, stakeholders, and public officials in early-stage thinking about major urban design initiatives.

These workshops provide a valuable resource to public agencies and major property owners that could benefit from big-picture design thinking as part of a larger planning and public outreach process. Modeled on existing programs such as the NEA's Mayors' Institute on City Design, ULI's technical advisory panel team workshops, and the AIA's RUDAT program, the Urban Design Workshops (UDW) pull together relevant professional experts, including architects, urban designers, transportation planners, and real estate experts —among others—to provide a holistic and design-focused look at particular urban areas.

The workshops involve a detailed briefing about the project issues, a moderated panel discussion to tease out the political and community issues surrounding the project, and a two-day working session that results in both design deliverables and a list of recommendations to inform and enrich the larger public discourse. Workshop leaders are invited by the UDW program director (the BSA President or his/her delegate), and they then work with volunteers culled through a selection process to assess design and software skills and interest level. The BSA's Urban Design Committee manages this process. The kick-off panel discussion and the presentation of the workshop "results" are open to the public.

The key to the success of the UDW workshops is engagement with the media during the planning stages. Targeted reporters and commentators are invited to participate in the kick-off panel discussion and cover the full scope of the workshop. In addition, the BSA encourages partnerships with professional organizations such as the APA, ASLA, and ULI. To maintain focus on the best unbiased professional-level thinking, the BSA has chosen not to partner with advocacy groups like Livable Streets, WalkBoston, or the Boston Harbor Association. We assume that these groups are engaged in the public debate about the projects or sites through their typical advocacy work.

In order to keep the program in the public eye while at the same time staying mindful of costs and organizational effort, two workshops will be held a year. The topics will be determined based on the relevancy of the design issue, the relative interest of public agency stakeholders, and the BSA's ongoing priorities as outlined by the Civic Engagement Task Force and supported by the Executive Committee of the Board.



Post-Workshop Initiatives and Impact

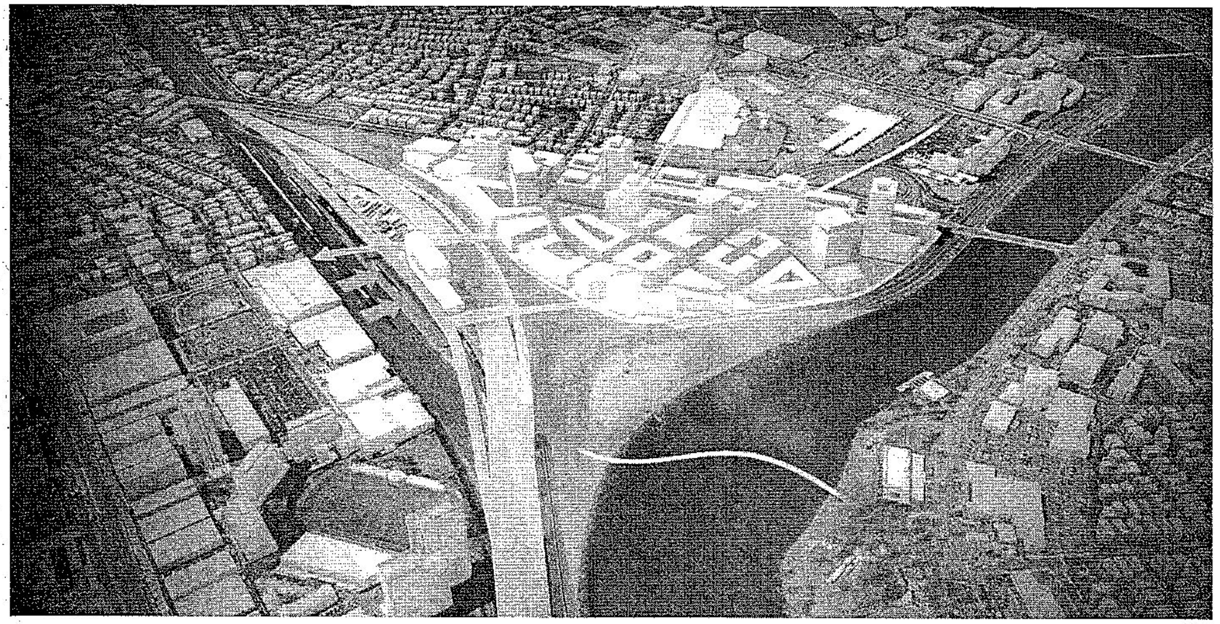
After the workshop, follow-up presentations of the charrette results were presented to the MassDOT project management and consultant team on Tuesday, October 21 and the planning staff of the BRA on Wednesday, October 22.

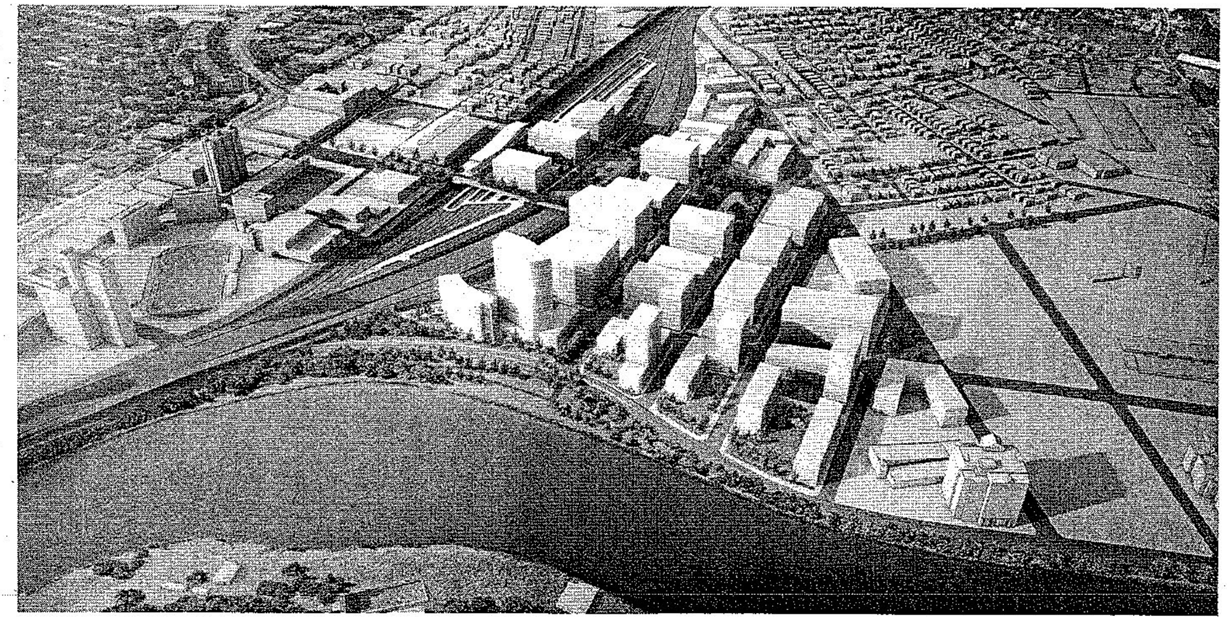
As demonstrated in the design proposals, the prioritized recommendations to MassDOT were:

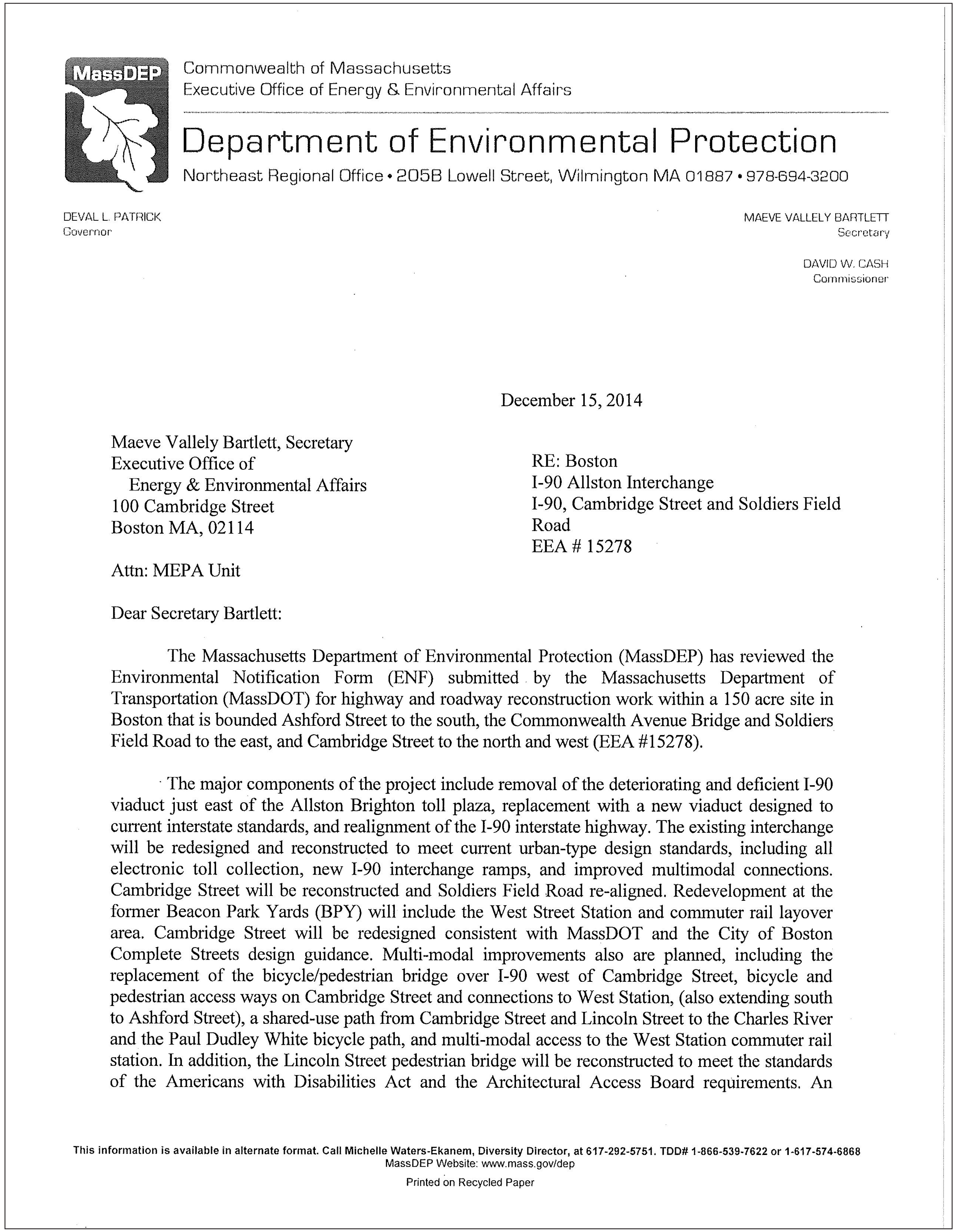
- Consider green stormwater infrastructure as an integrated component of the MassDOT contract (that anticipates a future central open space).
- Consider moving West Station access streets further west to reduce the height of the bridges and berms, making them more pedestrian-friendly. This will also create more Charles River-facing developable land.
- Consider aligning the West Station access streets with Malvern and Alcorn Streets to allow for future direct pedestrian and bicycle access.

MassDOT was receptive to the recommendations and committed to considering them in future iterations of the plan. The BRA was also receptive to the proposals and recommendations and plans to use some of the analysis done by the teams to inform and illustrate their own comments as the project progresses.

In addition, the key concepts and strategies of the two proposals were taken up by Tim Love's Graduate Research Studio at Northeastern University, a full-year design studio (2014-2015) focused on the urban design opportunities of Beacon Yards. Love engaged the Charles River Watershed Association, BRA, MassDOT, and MassDOT's Task Force as part of the on-going research and design initiative. Both MassDOT and the BRA will schedule follow-up meetings with Love and his students as their work advances.







MassDEP
Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Northeast Regional Office • 205B Lowell Street, Wilmington MA 01887 • 978-694-3200

DEVAL L. PATRICK
Governor

MAEVE VALLELY BARTLETT
Secretary

DAVID W. CASH
Commissioner

December 15, 2014

Maeve Vallely Bartlett, Secretary
Executive Office of
Energy & Environmental Affairs
100 Cambridge Street
Boston MA, 02114

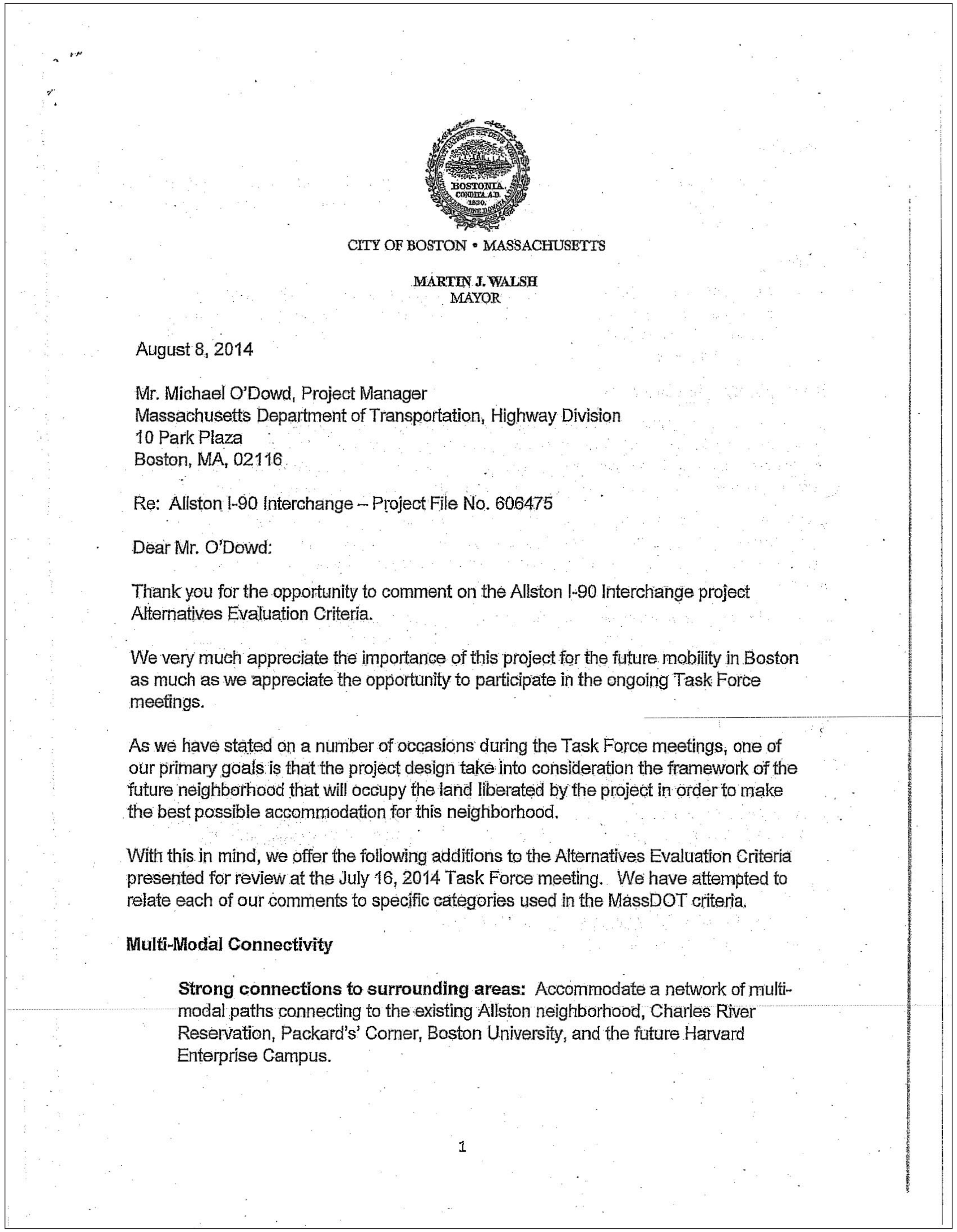
RE: Boston
I-90 Allston Interchange
I-90, Cambridge Street and Soldiers Field Road
EEA # 15278

Attn: MEPA Unit

Dear Secretary Bartlett:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the Environmental Notification Form (ENF) submitted by the Massachusetts Department of Transportation (MassDOT) for highway and roadway reconstruction work within a 150 acre site in Boston that is bounded Ashford Street to the south, the Commonwealth Avenue Bridge and Soldiers Field Road to the east, and Cambridge Street to the north and west (EEA #15278).

The major components of the project include removal of the deteriorating and deficient I-90 viaduct just east of the Allston Brighton toll plaza, replacement with a new viaduct designed to current interstate standards, and realignment of the I-90 interstate highway. The existing interchange will be redesigned and reconstructed to meet current urban-type design standards, including all electronic toll collection, new I-90 interchange ramps, and improved multimodal connections. Cambridge Street will be reconstructed and Soldiers Field Road re-aligned. Redevelopment at the former Beacon Park Yards (BPY) will include the West Street Station and commuter rail layover area. Cambridge Street will be redesigned consistent with MassDOT and the City of Boston Complete Streets design guidance. Multi-modal improvements also are planned, including the replacement of the bicycle/pedestrian bridge over I-90 west of Cambridge Street, bicycle and pedestrian access ways on Cambridge Street and connections to West Station, (also extending south to Ashford Street), a shared-use path from Cambridge Street and Lincoln Street to the Charles River and the Paul Dudley White bicycle path, and multi-modal access to the West Station commuter rail station. In addition, the Lincoln Street pedestrian bridge will be reconstructed to meet the standards of the Americans with Disabilities Act and the Architectural Access Board requirements. An



CITY OF BOSTON • MASSACHUSETTS

MARTIN J. WALSH
MAYOR

August 8, 2014

Mr. Michael O'Dowd, Project Manager
Massachusetts Department of Transportation, Highway Division
10 Park Plaza
Boston, MA, 02116

Re: Allston I-90 Interchange – Project File No. 606475

Dear Mr. O'Dowd:

Thank you for the opportunity to comment on the Allston I-90 Interchange project Alternatives Evaluation Criteria.

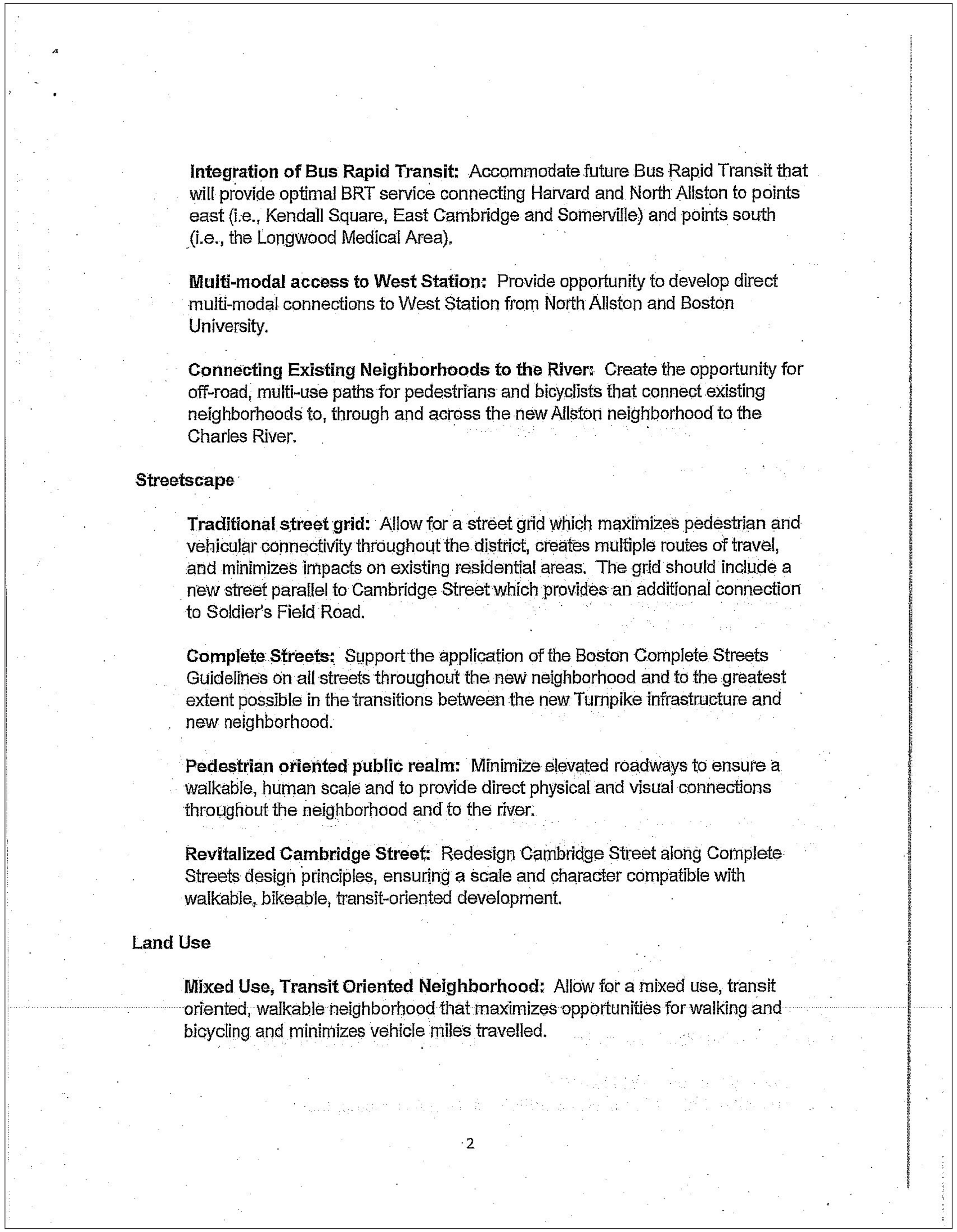
We very much appreciate the importance of this project for the future mobility in Boston as much as we appreciate the opportunity to participate in the ongoing Task Force meetings.

As we have stated on a number of occasions during the Task Force meetings, one of our primary goals is that the project design take into consideration the framework of the future neighborhood that will occupy the land liberated by the project in order to make the best possible accommodation for this neighborhood.

With this in mind, we offer the following additions to the Alternatives Evaluation Criteria presented for review at the July 16, 2014 Task Force meeting. We have attempted to relate each of our comments to specific categories used in the MassDOT criteria.

Multi-Modal Connectivity

> **Strong connections to surrounding areas:** Accommodate a network of multi-modal paths connecting to the existing Allston neighborhood, Charles River Reservation, Packard's' Corner, Boston University, and the future Harvard Enterprise Campus.



Integration of Bus Rapid Transit: Accommodate future Bus Rapid Transit that will provide optimal BRT service connecting Harvard and North Allston to points east (i.e., Kendall Square, East Cambridge and Somerville) and points south (i.e., the Longwood Medical Area).

Multi-modal access to West Station: Provide opportunity to develop direct multi-modal connections to West Station from North Allston and Boston University.

Connecting Existing Neighborhoods to the River: Create the opportunity for off-road, multi-use paths for pedestrians and bicyclists that connect existing neighborhoods to, through and across the new Allston neighborhood to the Charles River.

Streetscape

Traditional street grid: Allow for a street grid which maximizes pedestrian and vehicular connectivity throughout the district, creates multiple routes of travel, and minimizes impacts on existing residential areas. The grid should include a new street parallel to Cambridge Street which provides an additional connection to Soldier's Field Road.

Complete Streets: Support the application of the Boston Complete Streets Guidelines on all streets throughout the new neighborhood and to the greatest extent possible in the transitions between the new Turnpike infrastructure and new neighborhood.

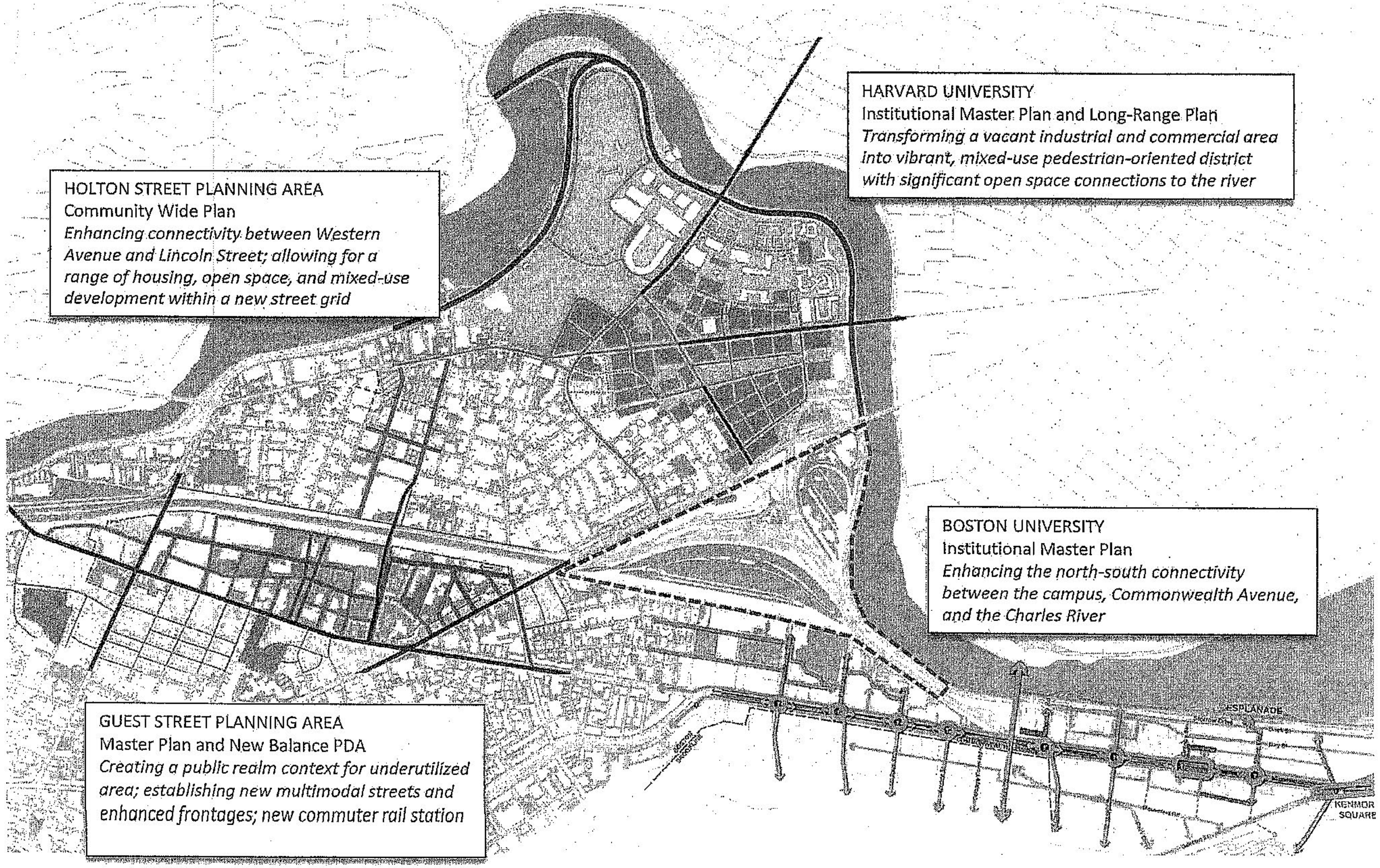
Pedestrian oriented public realm: Minimize elevated roadways to ensure a walkable, human scale and to provide direct physical and visual connections throughout the neighborhood and to the river.

Revitalized Cambridge Street: Redesign Cambridge Street along Complete Streets design principles, ensuring a scale and character compatible with walkable, bikeable, transit-oriented development.

Land Use

Mixed Use, Transit Oriented Neighborhood: Allow for a mixed use, transit oriented, walkable neighborhood that maximizes opportunities for walking and bicycling and minimizes vehicle miles travelled.

Allston Interchange: Recent planning surrounding the I-90 Interchange

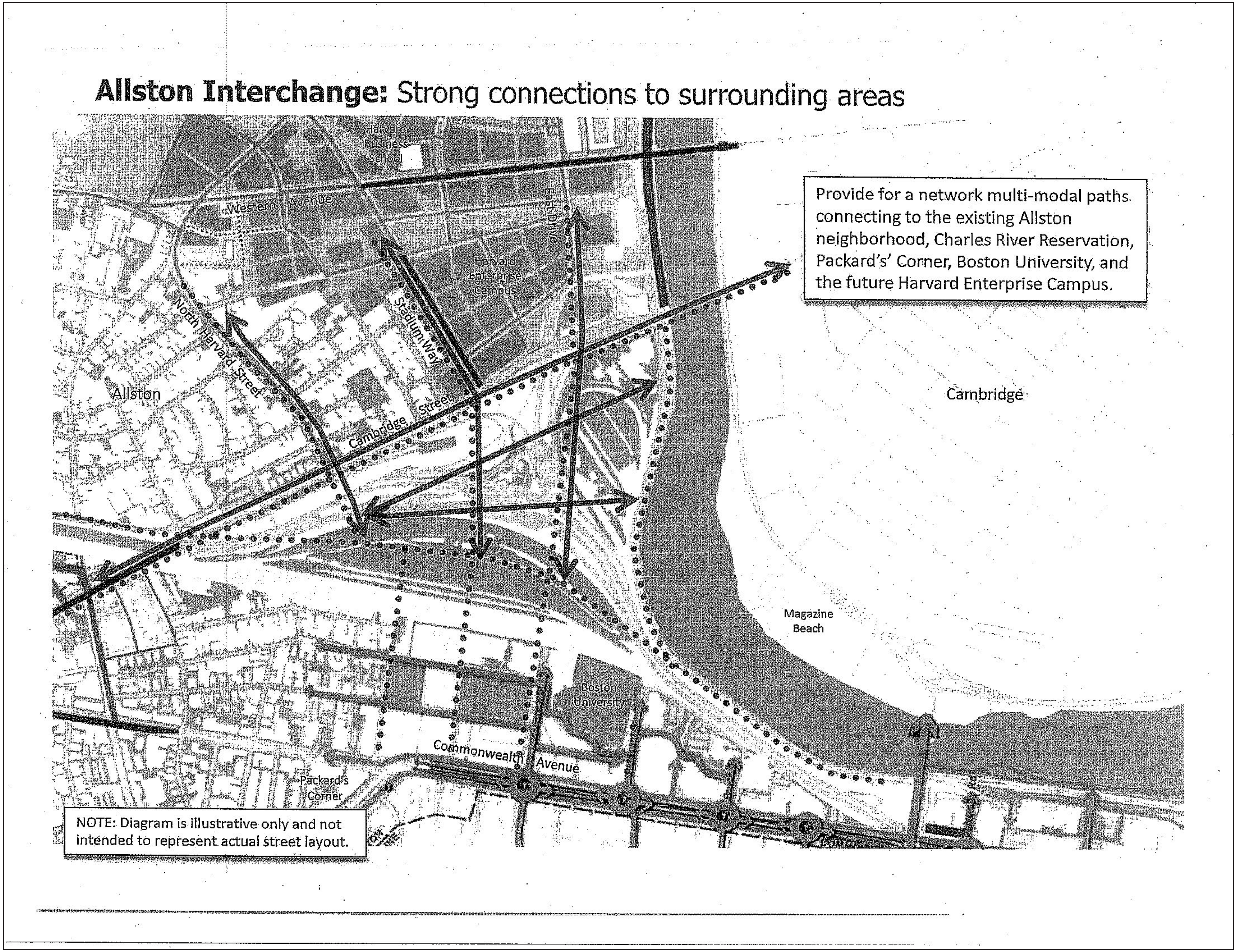


HOLTON STREET PLANNING AREA
Community Wide Plan
Enhancing connectivity between Western Avenue and Lincoln Street; allowing for a range of housing, open space, and mixed-use development within a new street grid

HARVARD UNIVERSITY
Institutional Master Plan and Long-Range Plan
Transforming a vacant industrial and commercial area into vibrant, mixed-use pedestrian-oriented district with significant open space connections to the river

BOSTON UNIVERSITY
Institutional Master Plan
Enhancing the north-south connectivity between the campus, Commonwealth Avenue, and the Charles River

GUEST STREET PLANNING AREA
Master Plan and New Balance PDA
Creating a public realm context for underutilized area; establishing new multimodal streets and enhanced frontages; new commuter rail station

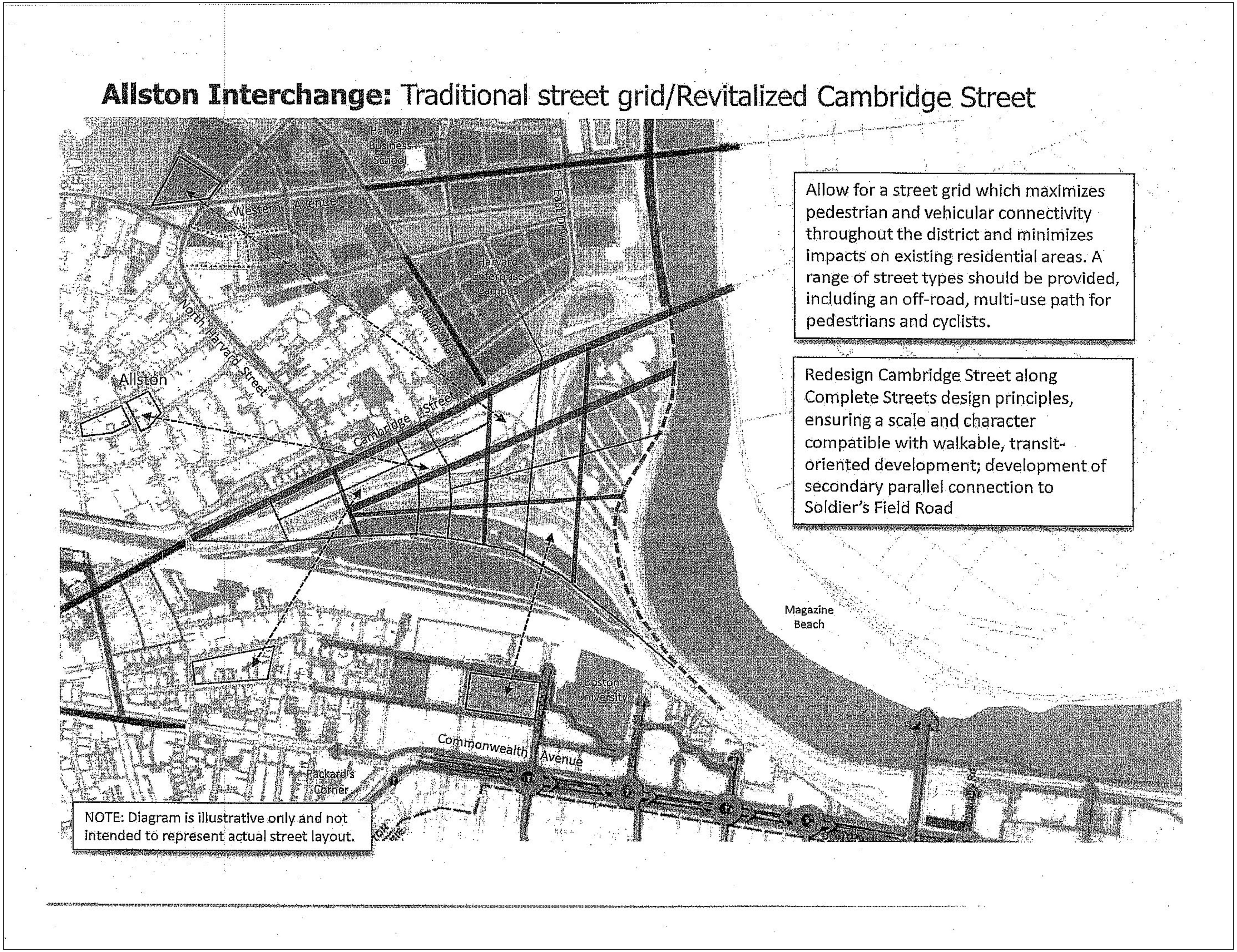


Allston Interchange: Strong connections to surrounding areas

Harvard Business School
Western Avenue
East Drive
Harvard Enterprise Campus
Stadium Way
North Harvard Street
Allston
Cambridge Street
Cambridge
Magazine Beach
Boston University
Commonwealth Avenue
Packard's Corner

Provide for a network multi-modal paths connecting to the existing Allston neighborhood, Charles River Reservation, Packard's' Corner, Boston University, and the future Harvard Enterprise Campus.

NOTE: Diagram is illustrative only and not intended to represent actual street layout.



Allston Interchange: Traditional street grid/Revitalized Cambridge Street

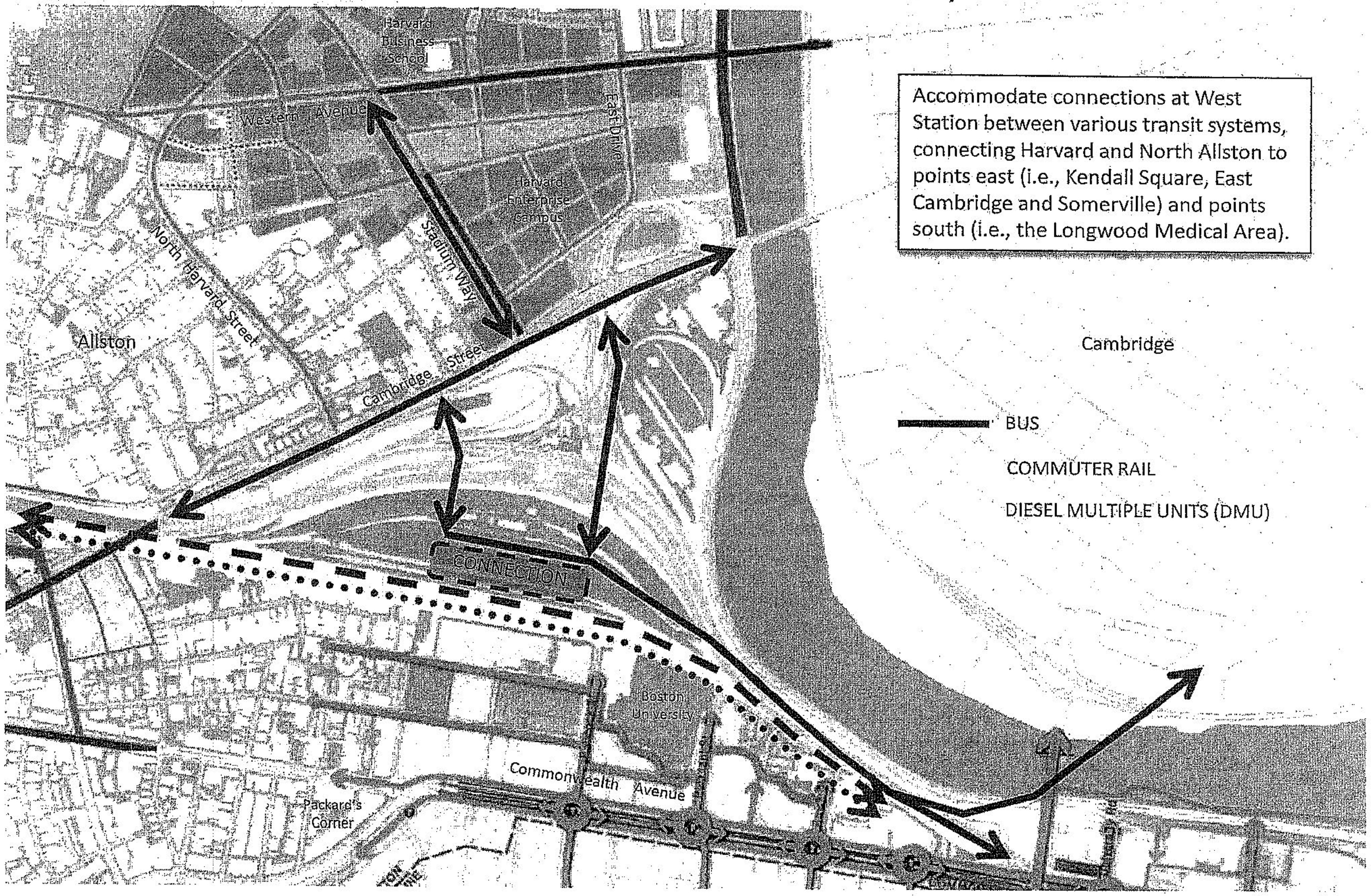
Harvard Business School
Western Avenue
East Drive
Harvard Enterprise Campus
Stadium Way
North Harvard Street
Allston
Cambridge Street
Magazine Beach
Boston University
Commonwealth Avenue
Packard's Corner

Allow for a street grid which maximizes pedestrian and vehicular connectivity throughout the district and minimizes impacts on existing residential areas. A range of street types should be provided, including an off-road, multi-use path for pedestrians and cyclists.

Redesign Cambridge Street along Complete Streets design principles, ensuring a scale and character compatible with walkable, transit-oriented development; development of secondary parallel connection to Soldier's Field Road

NOTE: Diagram is illustrative only and not intended to represent actual street layout.

Allston Interchange: Integration of bus and rail transit systems


Harvard Business School
Western Avenue
East Drive
Harvard Enterprise Campus
Stadium Way
North Harvard Street
Allston
Cambridge Street
CONNECTION
Boston University
Commonwealth Avenue
Packard's Corner
Cambridge

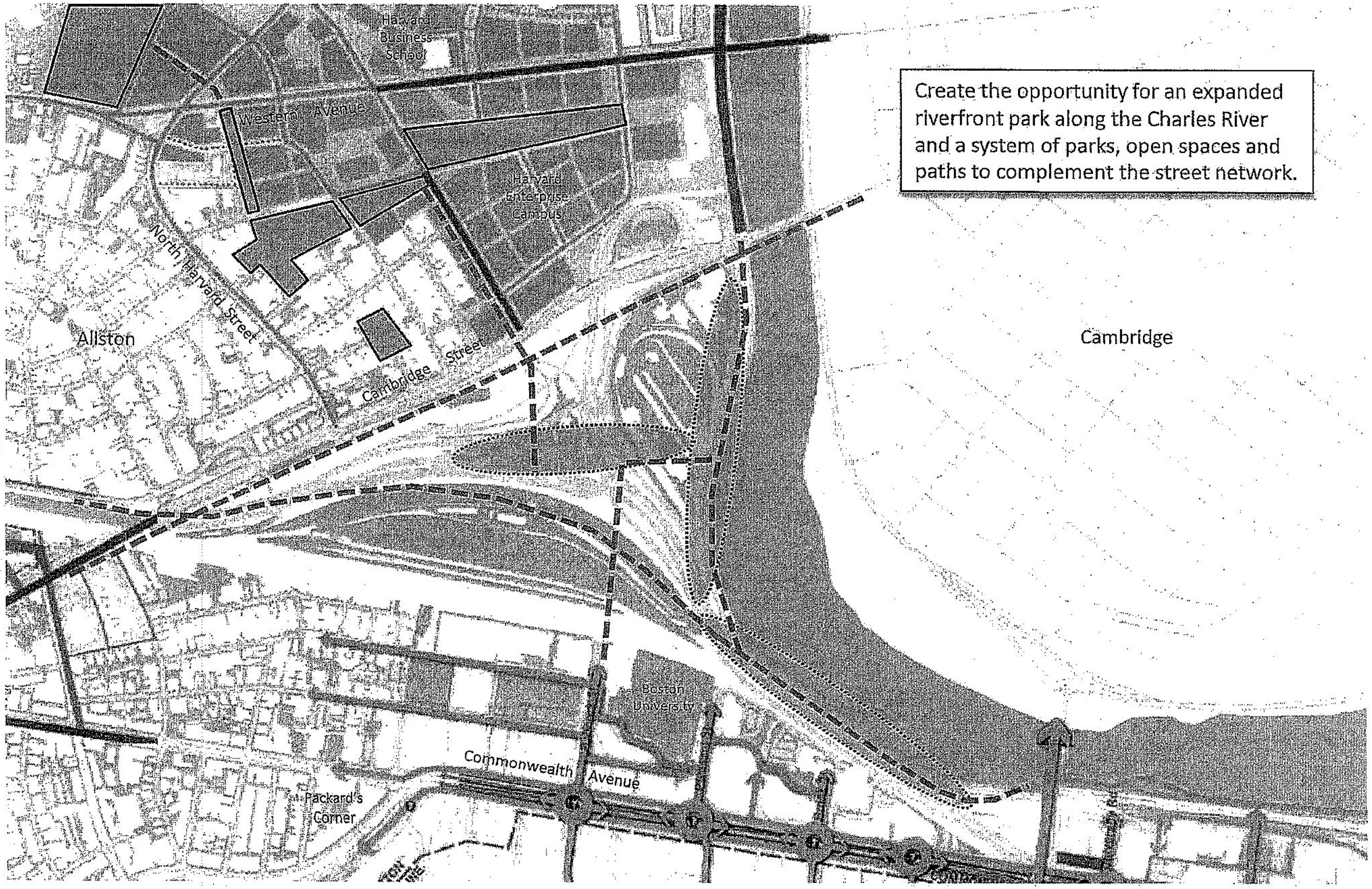
Accommodate connections at West Station between various transit systems, connecting Harvard and North Allston to points east (i.e., Kendall Square, East Cambridge and Somerville) and points south (i.e., the Longwood Medical Area).

━ BUS

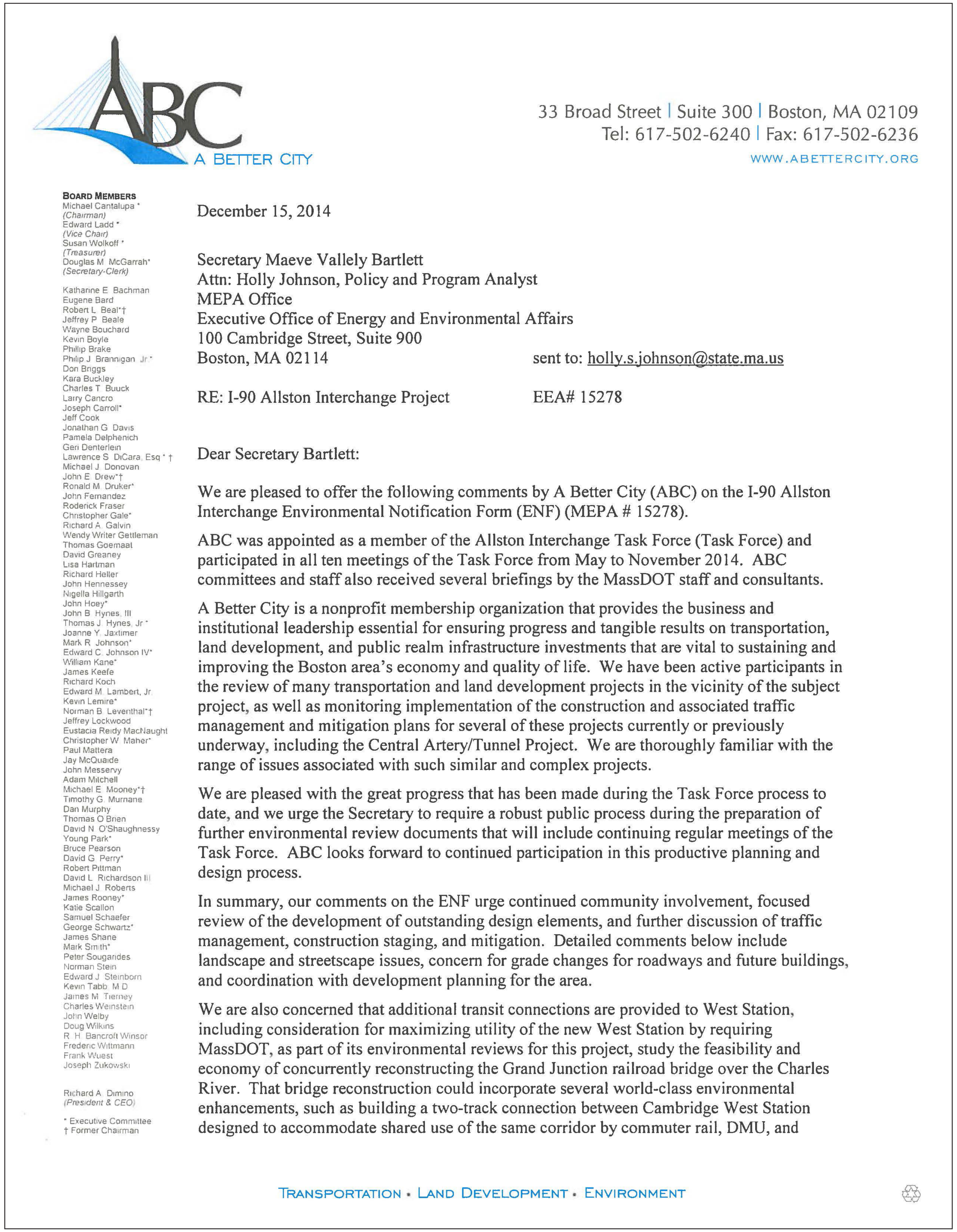
COMMUTER RAIL

DIESEL MULTIPLE UNITS (DMU)

Allston Interchange: Development of open space network


Harvard Business School
Western Avenue
Harvard Enterprise Campus
North Harvard Street
Allston
Cambridge Street
Cambridge
Boston University
Commonwealth Avenue
Packard's Corner

Create the opportunity for an expanded riverfront park along the Charles River and a system of parks, open spaces and paths to complement the street network.



A BETTER CITY

33 Broad Street | Suite 300 | Boston, MA 02109
Tel: 617-502-6240 | Fax: 617-502-6236
WWW.ABETTERCITY.ORG

December 15, 2014

Secretary Maeve Vallely Bartlett
Attn: Holly Johnson, Policy and Program Analyst
MEPA Office
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114 sent to: holly.s.johnson@state.ma.us

RE: I-90 Allston Interchange Project EEA# 15278

Dear Secretary Bartlett:

We are pleased to offer the following comments by A Better City (ABC) on the I-90 Allston Interchange Environmental Notification Form (ENF) (MEPA # 15278).

ABC was appointed as a member of the Allston Interchange Task Force (Task Force) and participated in all ten meetings of the Task Force from May to November 2014. ABC committees and staff also received several briefings by the MassDOT staff and consultants.

A Better City is a nonprofit membership organization that provides the business and institutional leadership essential for ensuring progress and tangible results on transportation, land development, and public realm infrastructure investments that are vital to sustaining and improving the Boston area's economy and quality of life. We have been active participants in the review of many transportation and land development projects in the vicinity of the subject project, as well as monitoring implementation of the construction and associated traffic management and mitigation plans for several of these projects currently or previously underway, including the Central Artery/Tunnel Project. We are thoroughly familiar with the range of issues associated with such similar and complex projects.

We are pleased with the great progress that has been made during the Task Force process to date, and we urge the Secretary to require a robust public process during the preparation of further environmental review documents that will include continuing regular meetings of the Task Force. ABC looks forward to continued participation in this productive planning and design process.

In summary, our comments on the ENF urge continued community involvement, focused review of the development of outstanding design elements, and further discussion of traffic management, construction staging, and mitigation. Detailed comments below include landscape and streetscape issues, concern for grade changes for roadways and future buildings, and coordination with development planning for the area.

We are also concerned that additional transit connections are provided to West Station, including consideration for maximizing utility of the new West Station by requiring MassDOT, as part of its environmental reviews for this project, study the feasibility and economy of concurrently reconstructing the Grand Junction railroad bridge over the Charles River. That bridge reconstruction could incorporate several world-class environmental enhancements, such as building a two-track connection between Cambridge West Station designed to accommodate shared use of the same corridor by commuter rail, DMU, and

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Richard A. Dimino
(President & CEO)

* Executive Committee
† Former Chairman

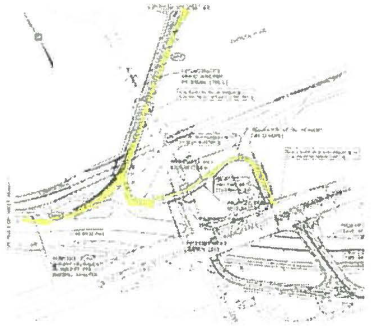
It may also be appropriate to consider pedestrian and bicycle approach decks or bridges that are not adjacent to the approach roads, service roads, or ramps to provide further separation from the impacts of buses and other vehicles. ABC-10

If decking or potential air rights construction is to be considered in the future, there needs to be an analysis of methods for providing foundations and substructure. Options for the location and timing of foundation construction should be considered, with appropriate assumptions about future design loads and structural design. Similar provisions for future development were provided in the past in the track and platform area adjacent to South Station. ABC-11

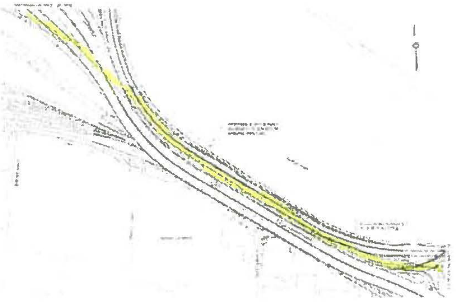
Providing Bus Access to West Station

The MassDOT consultant team and the Allston Interchange Task Force have spent time studying and discussing how to provide access to the site of the future West Station. Options for providing multi-modal access from the north have been presented, and the question of how to provide multi-modal access from the south have been raised. Regarding bus access between the Commonwealth Avenue side of the site and the proposed West Station, it would be worthwhile revisiting a concept developed in 2008 as part of the Urban Ring RDEIR/DEIS. ABC-12

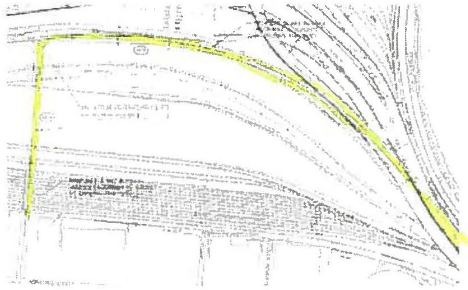
The drawings below from the November 2008 environmental document (highlighted in yellow on several alignment drawings) show the Locally Preferred Alternative for the Urban Ring project.



Urban Ring alignment at the BU and Grand Junction Bridges

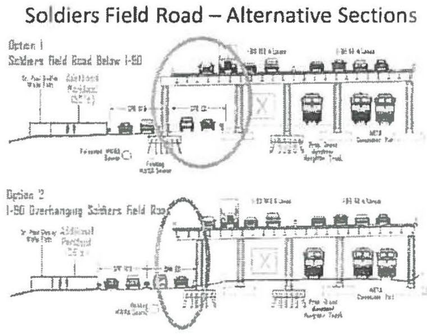


Urban Ring alignment beside the existing I-90 viaduct



Urban Ring alignment under the viaduct and through the existing rail yard to the West Station site

In the currently evolving plan for the interchange and viaduct redesign, an open corridor is shown under a portion of two options for the proposed new viaduct. The cross section and track locations may vary, and in both options, the "X" bay may be wide enough to accommodate two way bus operations. ABC-12 (Cont.)


Soldiers Field Road – Alternative Sections
Option 1
Soldiers Field Road Below I-90
Option 2
I-90 Overhanging Soldiers Field Road

Future viaduct options presented to the Interchange Task Force

The Urban Ring routes for Bus Rapid Transit in the vicinity of the Allston Interchange should be reviewed and incorporated in the new interchange design.

A Better City believes that providing a Bus Rapid Transit connection between West Station and the Commonwealth Avenue side will be important for regional and local public transportation. Adapting the 2008 plan to the reconfiguration of the viaduct, interchange, Grand Junction bridge, and rail yard provides one means for attaining that end. ABC-12 (Cont.)

Attributes for "Peoples' Pike"

MassDOT and the Task Force developed a good concept for a major new off-road multi-use trail that would provide world-class accommodations to pedestrians and bicyclists. MassDOT appeared to agree that it would include this major new pedestrian and bicyclist facility--dubbed by several Task Force participants as the "People's Pike"-- in its proposed project. ABC agrees that this new facility should be provided sufficient width to maximize safety of its users, encourage increased usage by all age groups, and greater modal share for walking and bicycling. Using MassDOT's own Highway Design Guide parlance, ABC suggests that ABC-13

Concluding Comments

In conclusion, we believe that the Secretary should consider a range of additional studies and mitigation described above, as well as further refinement of the present alternatives, including all design elements and enhancements listed on page 7 of the ENF. The scoping of this analysis in the Draft Environmental Impact Report will influence the scope for the project to be implemented, the analysis will better inform the process so that good decisions are made in the context of more complete information. ABC-19

A Better City looks forward to a continued role during the environmental process, during design, and through the implementation of this very important project for the neighborhoods, institutions, the cities, and the region.

We look forward to review of the scope in your forthcoming MEPA Certificate.

Sincerely,

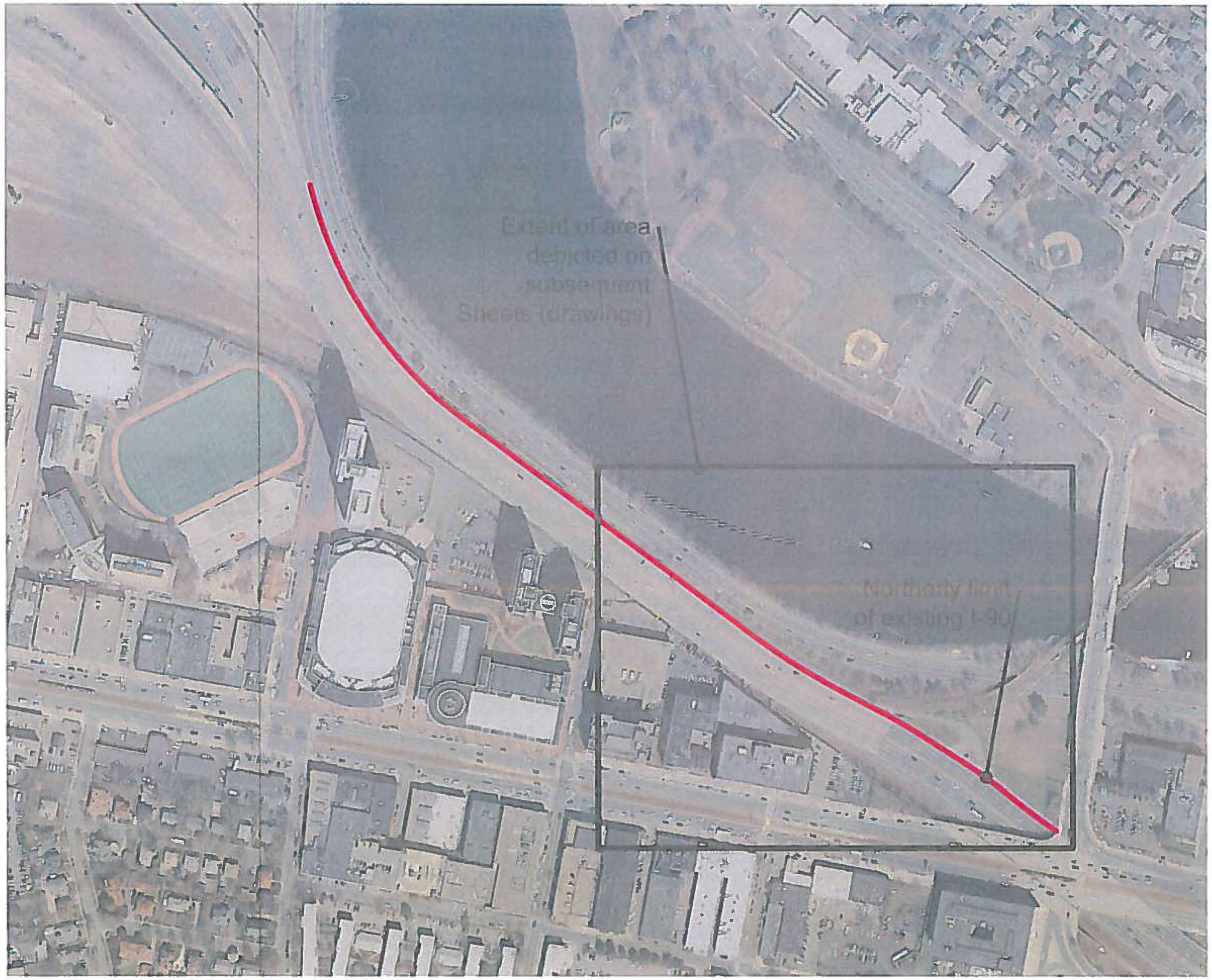
Richard A. Dimino
President and CEO

cc: James Cerbone
Frank DePaola
Michael O'Dowd
James Gillooly
Kairos Shen

6183/3 aitltd15

ABC COMMENTS I-90 ALLSTON.dwg

12/14/2014


Extent of area depicted on subsequent Sheets (drawings)
Northerly limit of existing I-90

General Notes / Revision No.–Issue (Date)

1. "Red" (color) line is northerly limit of this section of existing I-90 Viaduct.
2. "Black" (color) box shows extent of area depicted (locus) on subsequent Sheets (drawings), unless otherwise noted.

N

Project Name and Address

A BETTER CITY:
COMMENTS ON I–90 ALLSTON
INTERCHANGE PROJECT

Sheet Title:

Construction Staging:
Locus Plan

Project

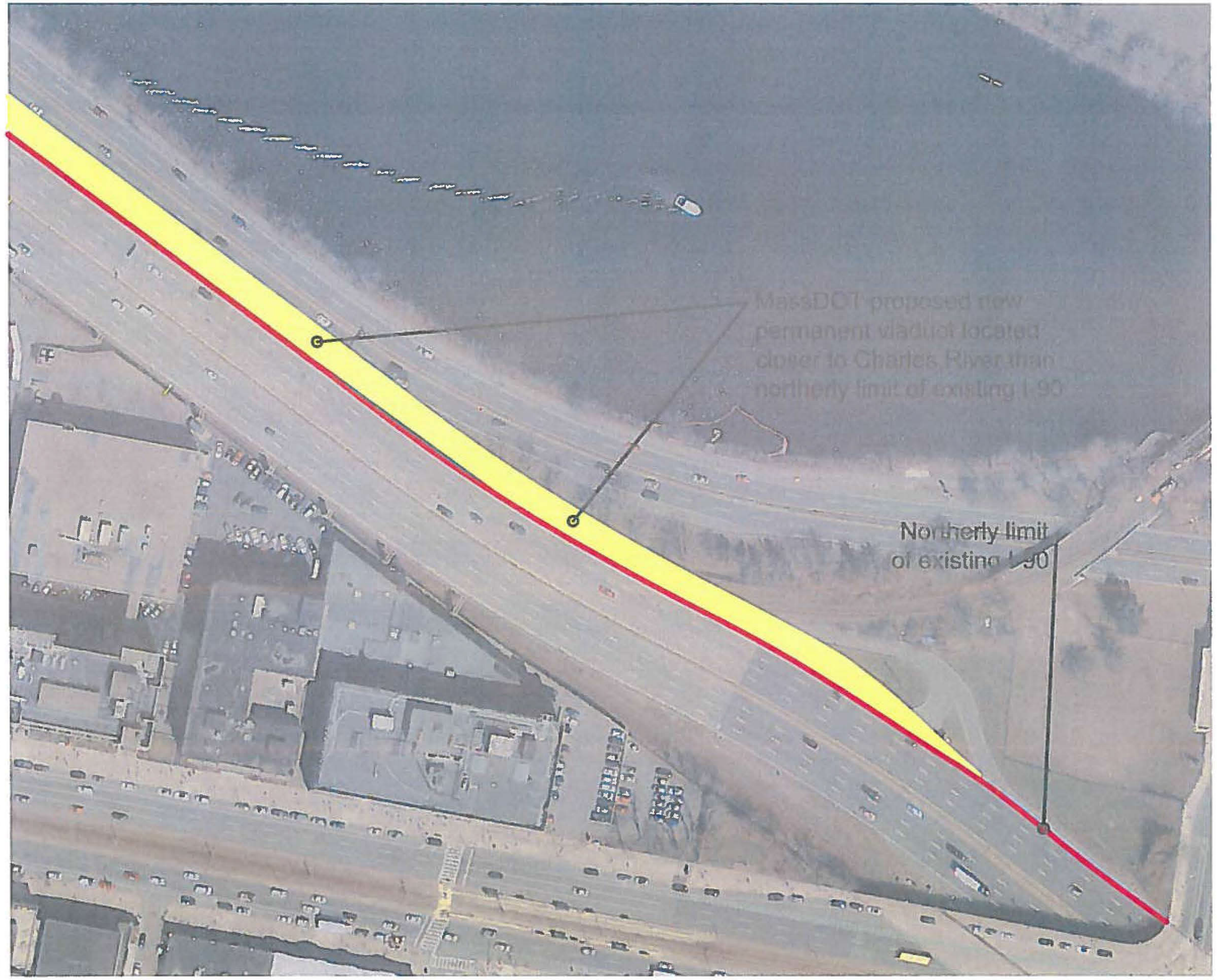
Date 12/14/14

Scale N.A.

Sheet A–1

ABC COMMENTS I-90 ALLSTON.dwg

12/14/2014


MassDOT proposed new permanent viaduct located closer to Charles River than northerly limit of existing I-90
Northerly limit of existing I-90

General Notes / Revision No.-Issue (Date)

1. "Red" color line is northerly limit of this section of existing I-90 Viaduct.
2. "Yellow" color area (approx.) of MassDOT proposed permanent new viaduct and possible permanent Section 4(f) taking.

N

Project Name and Address

A BETTER CITY:
COMMENTS ON I-90 ALLSTON INTERCHANGE PROJECT

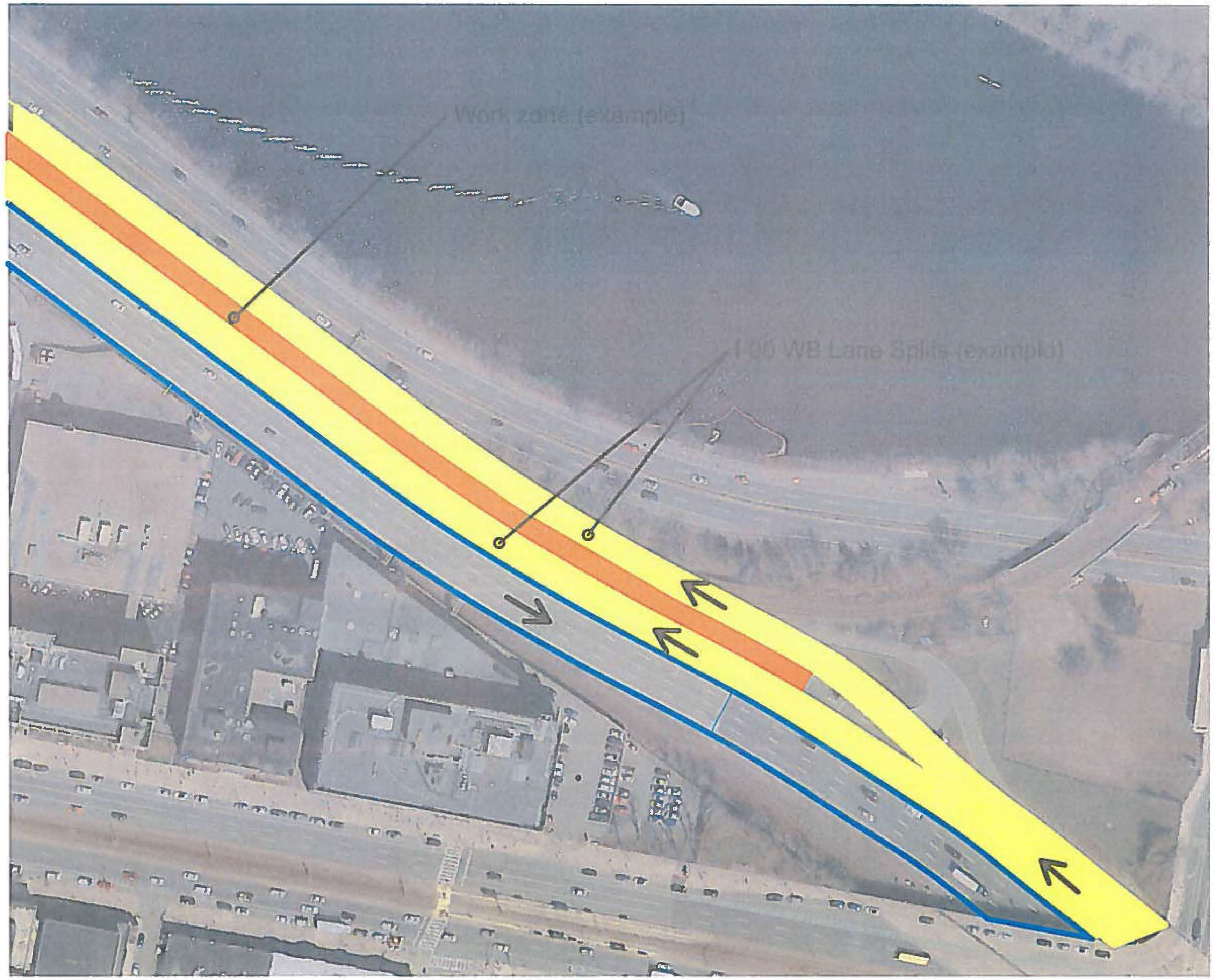
Sheet Title:

Construction Staging: MassDOT Proposed permanent new viaduct and possible Section 4(f) taking

Project
Date 12/14/14
Scale N.A.
Sheet A-2

ABC COMMENTS I–90 ALLSTON.dwg

12/14/2014



General Notes / Revision No.—Issue (Date)

1. "Yellow" color area depicts I-90 WB lane-splits under MassDOT Proposed viaduct reconstruction Stage 1.
2. "Orange" color depicts construction area for new I-90 viaduct under Stage 1.
3. "Blue" color is existing I-90 EB.

N

Project Name and Address

A BETTER CITY:
COMMENTS ON I–90 ALLSTON INTERCHANGE PROJECT

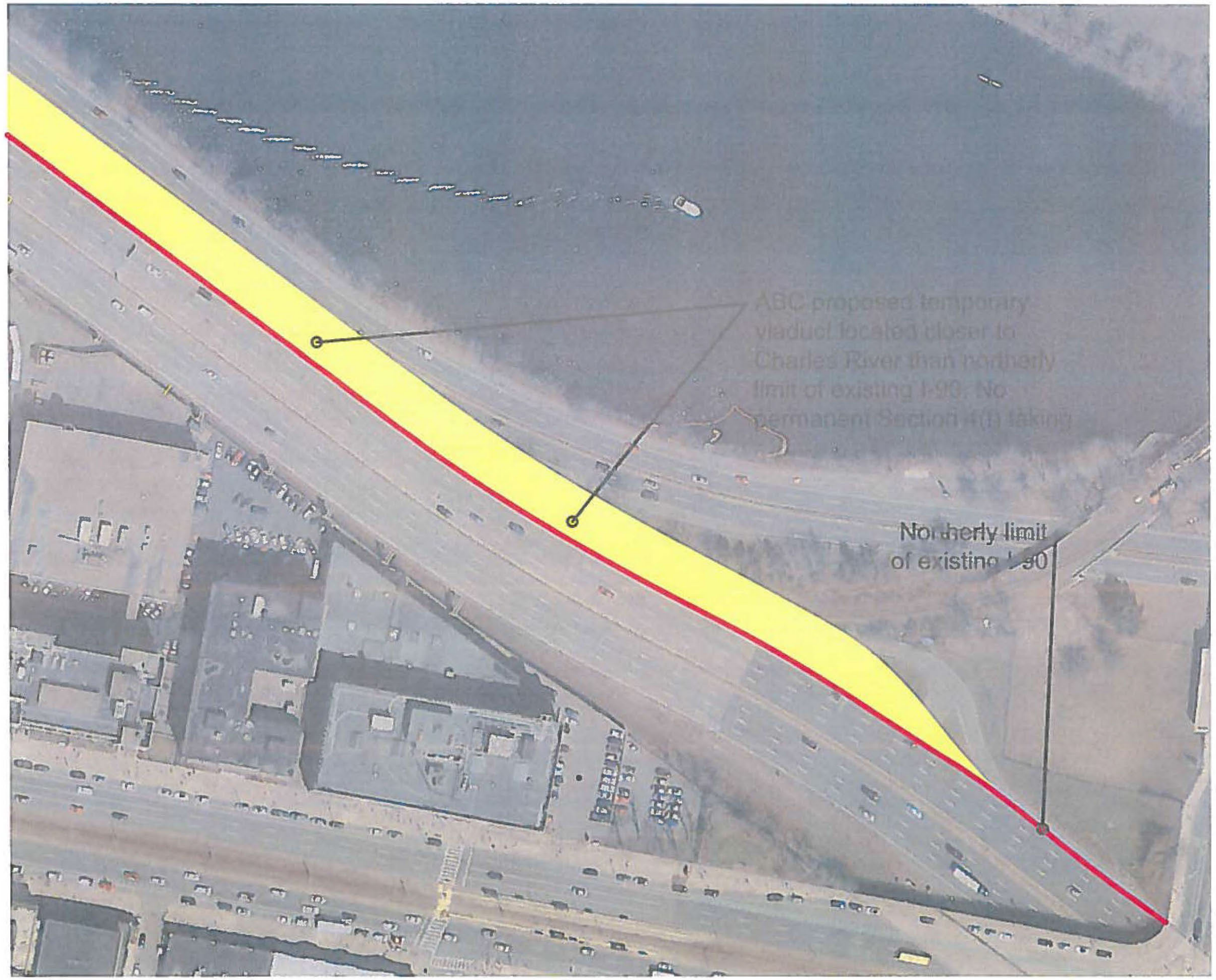
Sheet Title:

Construction Staging:
MassDOT Proposed "Stage 1"
I-90 "Lane-Splits"

Project		Sheet
Date	12/14/14	A–3
Scale	N.A.	

ABC COMMENTS I–90 ALLSTON.dwg

12/14/2014


ABC proposed temporary viaduct located closer to Charles River than northerly limit of existing I-90. No permanent Section 4(f) taking
Northerly limit of existing I-90
N

General Notes / Revision No.–Issue (Date)

1. "Red" color line is northerly limit of this section of existing I-90 Viaduct.
2. "Yellow" color area (approx.) of ABC proposed temporary new viaduct. Under this alternative, there is no permanent Section 4(f) taking.

Project Name and Address

A BETTER CITY:
COMMENTS ON I–90 ALLSTON
INTERCHANGE PROJECT

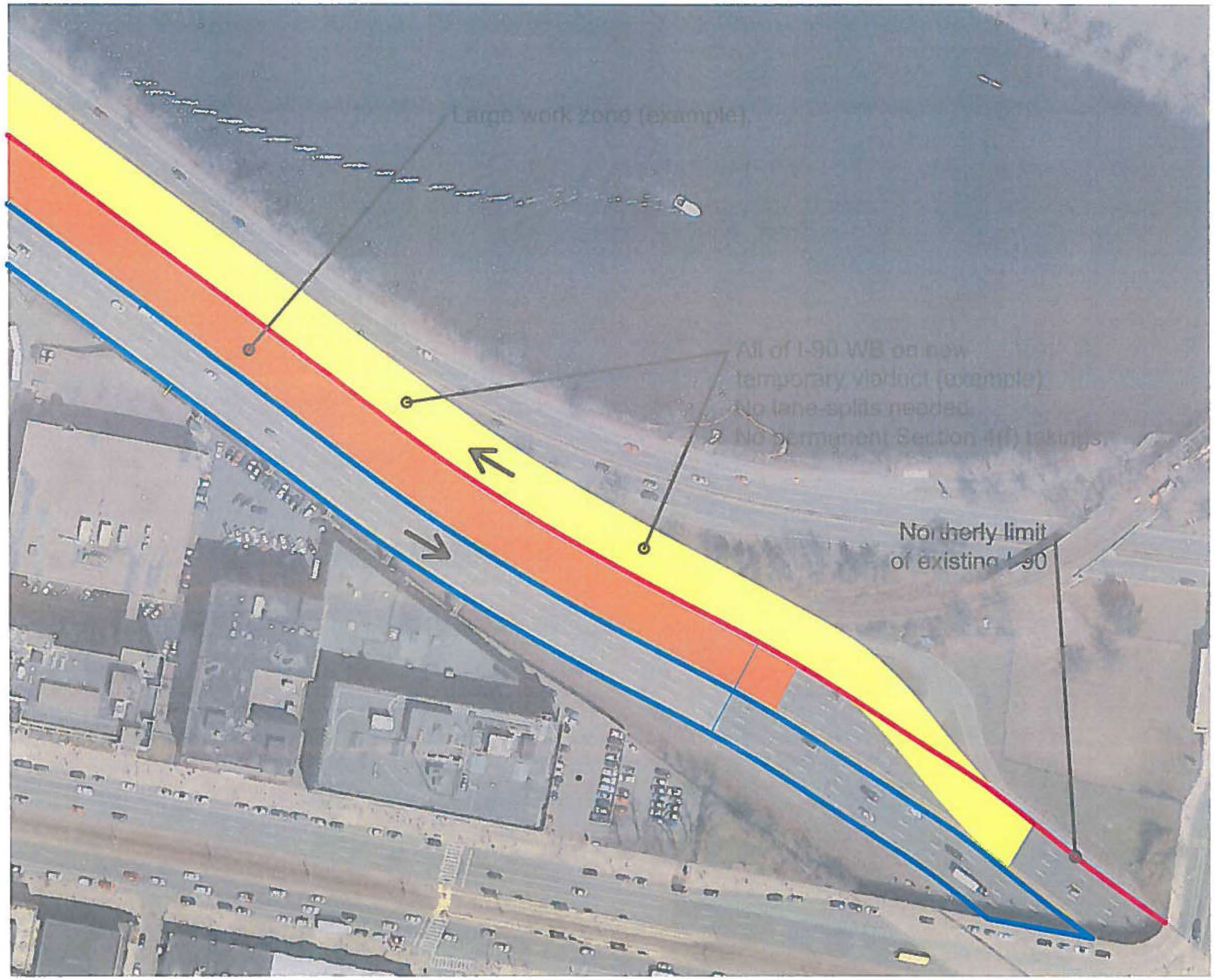
Sheet Title:

Construction Staging:
ABC Proposed Alternative 1,
Temporary Viaduct,
Stage 1

Project
Date 12/14/14
Scale N.A.
Sheet B–1

ABC COMMENTS I-90 ALLSTON.dwg

12/14/2014


Large work zone (example).
All of I-90 WB on new
temporary viaduct (example).
No lane-splits needed.
No permanent Section 4(f) takings.
Northerly limit
of existing I-90

General Notes /
Revision No.–Issue (Date)

1. "Yellow" color area depicts I-90 WB (all lanes) on new temporary viaduct under ABC Proposed Alt. 1. No lane-splits needed. No permanent taking of Section 4(f) lands.
2. "Orange" color depicts large work zone, sufficient to construct $\frac{1}{2}$ of new I-90 viaduct under Stage 1.
3. "Blue" color is existing I-90 EB.

N

Project Name and Address

A BETTER CITY:
COMMENTS ON I–90 ALLSTON
INTERCHANGE PROJECT

Sheet Title:

Construction Staging:
ABC Proposed Alternative 1,
Temporary Viaduct, Stage 2

Project

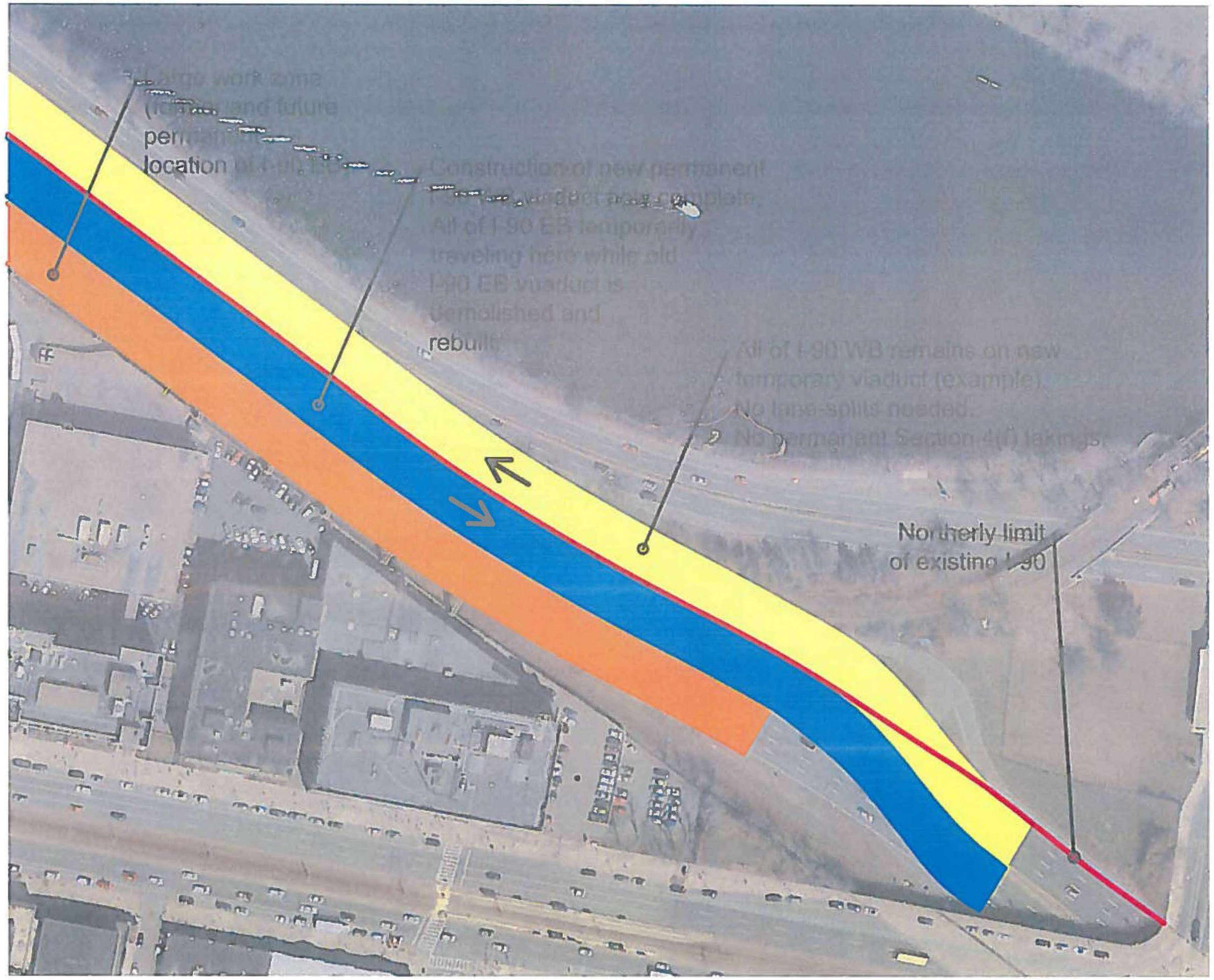
Date 12/14/14

Scale N.A.

Sheet B—2

ABC COMMENTS I-90 ALLSTON.dwg

12/14/2014


Large work zone (former and future permanent location of I-90 EB)
Construction of new permanent I-90 EB viaduct now complete. All of I-90 EB temporarily traveling here while old I-90 EB viaduct is demolished and rebuilt.
All of I-90 WB remains on new temporary viaduct (example). No lane-splits needed. No permanent Section 4(f) takings.
Northerly limit of existing I-90

General Notes /
Revision No.-Issue (Date)

1. "Yellow" color area depicts I-90 WB (all lanes) on new temporary viaduct under ABC Proposed Alt. 1. No lane-splits needed. No permanent taking of Section 4(f) lands.
2. "Orange" color depicts large work zone, sufficient to construct $\frac{1}{2}$ of new I-90 viaduct under Stage 1.
3. "Blue" color is existing I-90 EB.

N

Project Name and Address

A BETTER CITY:
COMMENTS ON I-90 ALLSTON
INTERCHANGE PROJECT

Sheet Title:

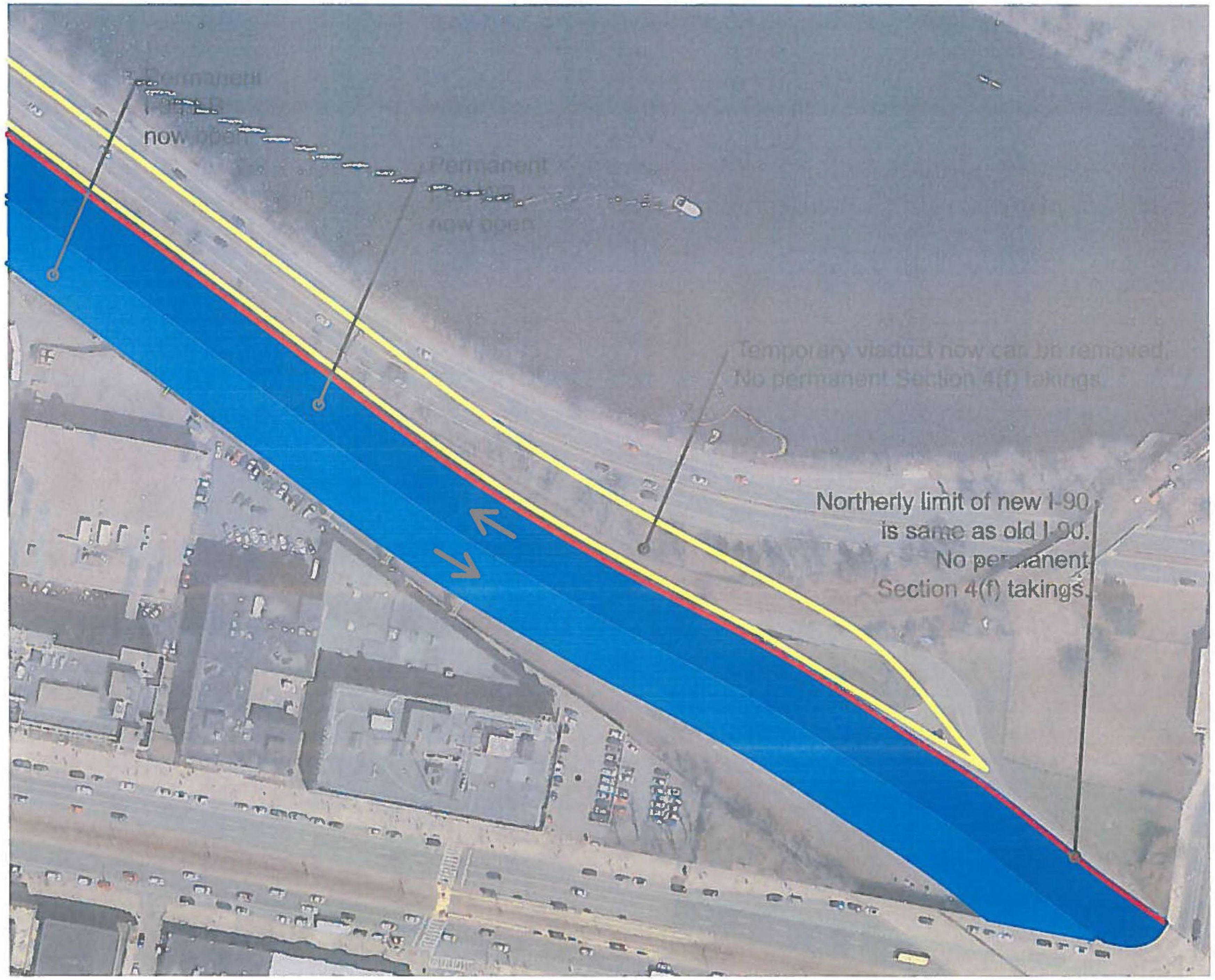
Construction Staging:
ABC Proposed Alternative 1,
Temporary Viaduct, Stage 3

Project
Date 12/14/14
Scale N.A.

Sheet
B-3

ABC COMMENTS I–90 ALLSTON.dwg

12/14/2014


Permanent
now open
Permanent
now open
Temporary viaduct now can be removed.
No permanent Section 4(f) takings.
Northerly limit of new I-90
is same as old I-90.
No permanent
Section 4(f) takings.

General Notes / Revision No.–Issue (Date)

1. "Yellow" color area depicts footprint of temporary viaduct that can now be demolished. No permanent taking of Section 4(f) lands.
2. "Dark Blue" color depicts permanent I-90 WB now reopened.
3. "Light Blue" color depicts permanent I-90 EB now reopened.
4. New I-90 does not cross "red" color Section 4(f) line that shows northerly limit of old I-90.

N

Project Name and Address

A BETTER CITY:
COMMENTS ON I–90 ALLSTON
INTERCHANGE PROJECT

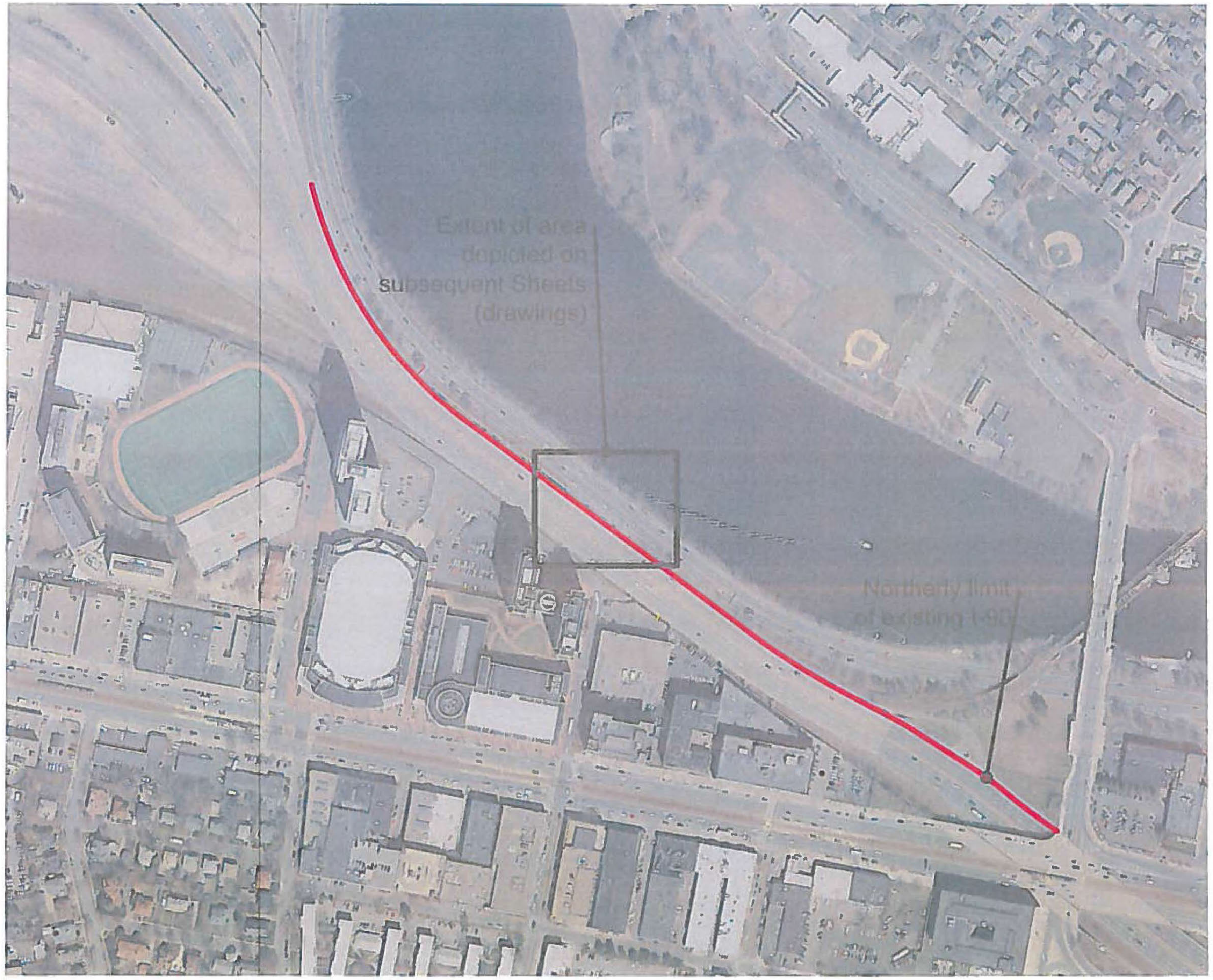
Sheet Title:

Construction Staging:
ABC Proposed Alternative 1,
Temporary Viaduct, Stage 4

Project		Sheet
Date	12/14/14	B–4
Scale	N.A.	

ABC COMMENTS I-90 ALLSTON.dwg

12/14/2014


Extent of area depicted on subsequent Sheets (drawings)
Northerly limit of existing I-90

General Notes / Revision No.–Issue (Date)

1. "Red" (color) line is northerly limit of this section of existing I-90 Viaduct.
2. "Black" (color) box shows extent of area depicted (locus) on subsequent Sheets (drawings), unless otherwise noted.

N

Project Name and Address

A BETTER CITY:
COMMENTS ON I–90 ALLSTON
INTERCHANGE PROJECT

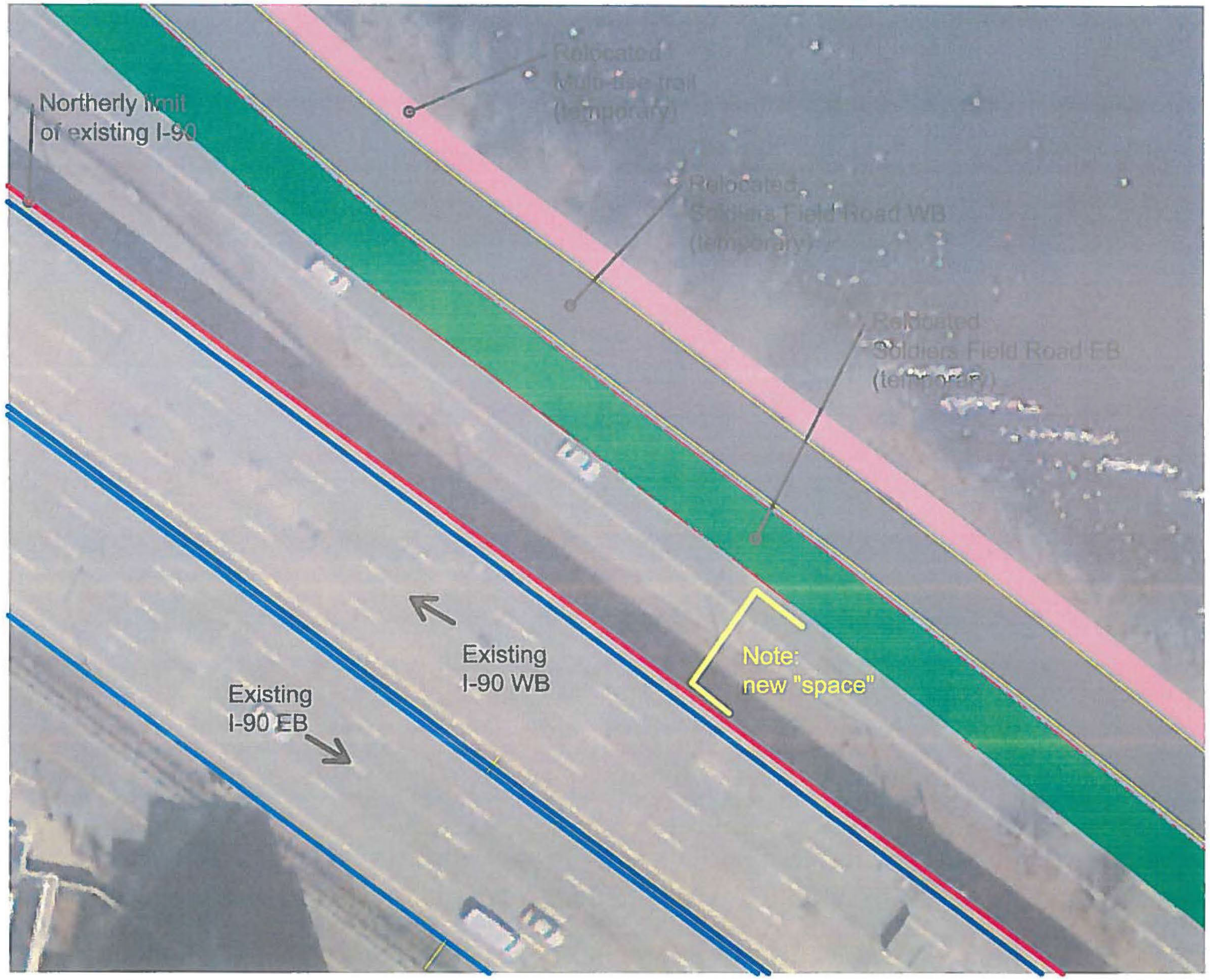
Sheet Title:

Construction Staging:
ABC Proposed Alternative 2,
I-90 WB At-Grade,
Locus Plan

Project		Sheet
Date	12/14/14	C–1
Scale	N.A.	

ABC COMMENTS I-90 ALLSTON.dwg

12/14/2014


Northerly limit of existing I-90
Relocated Multi-Use trail (temporary)
Relocated Soldiers Field Road WB (temporary)
Relocated Soldiers Field Road EB (temporary)
Note: new "space"
Existing I-90 WB
Existing I-90 EB

General Notes / Revision No.–Issue (Date)

1. "Pink" color depicts temp. relocated multi-use trail.
2. "Black" color depicts temp. relocated Soldiers Field Road WB.
3. "Green" color depicts temp. relocated Soldiers Field Road EB.
4. Note "yellow" color: new space at ground level created between old I-90 WB viaduct and temp. relocated Soldiers Field Road EB.

N

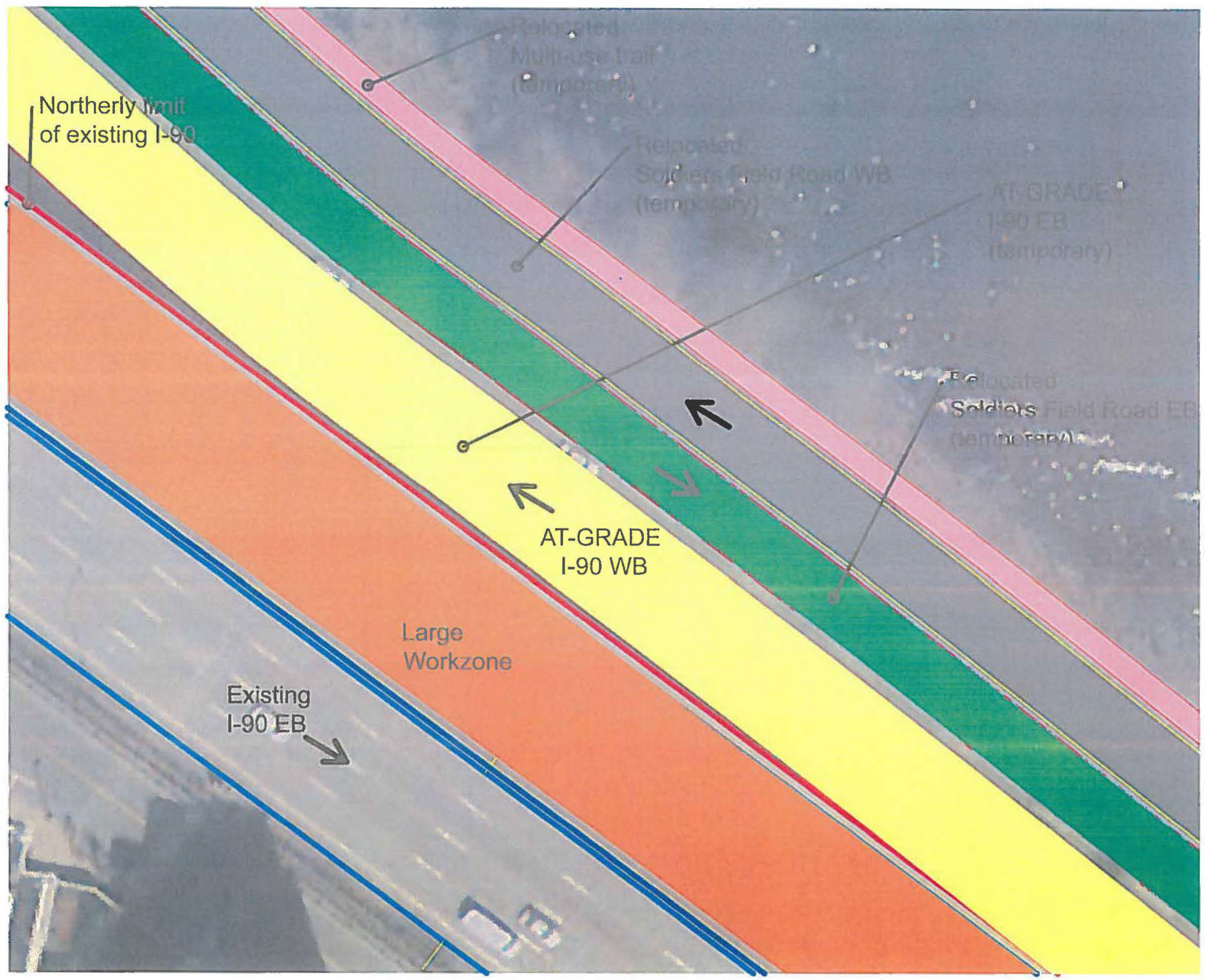
Project Name and Address
A BETTER CITY:
COMMENTS ON I–90 ALLSTON
INTERCHANGE PROJECT

Sheet Title:
Construction Staging:
ABC Proposed Alternative 2,
I-90 WB At-Grade, Stage 1

Project		Sheet
Date	12/14/14	C–2
Scale	N.A.	

ABC COMMENTS I–90 ALLSTON.dwg

12/14/2014


Relocated Multi-use trail (temporary)
Northerly limit of existing I-90
Relocated Soldiers Field Road WB (temporary)
AT-GRADE I-90 EB (temporary)
Relocated Soldiers Field Road EB (temporary)
AT-GRADE I-90 WB
Large Workzone
Existing I-90 EB

General Notes / Revision No.–Issue (Date)

1. "Yellow" color: AT-GRADE I-90 WB (temp.)
2. "Pink" color depicts temp. relocated multi-use trail.
3. "Black" color depicts temp. relocated Soldiers Field Road WB.
4. "Green" color depicts temp. relocated Soldiers Field Road EB.
5. "Orange" color depicts workzone in old I-90 WB alignment.

N

Project Name and Address

A BETTER CITY:
COMMENTS ON I–90 ALLSTON INTERCHANGE PROJECT

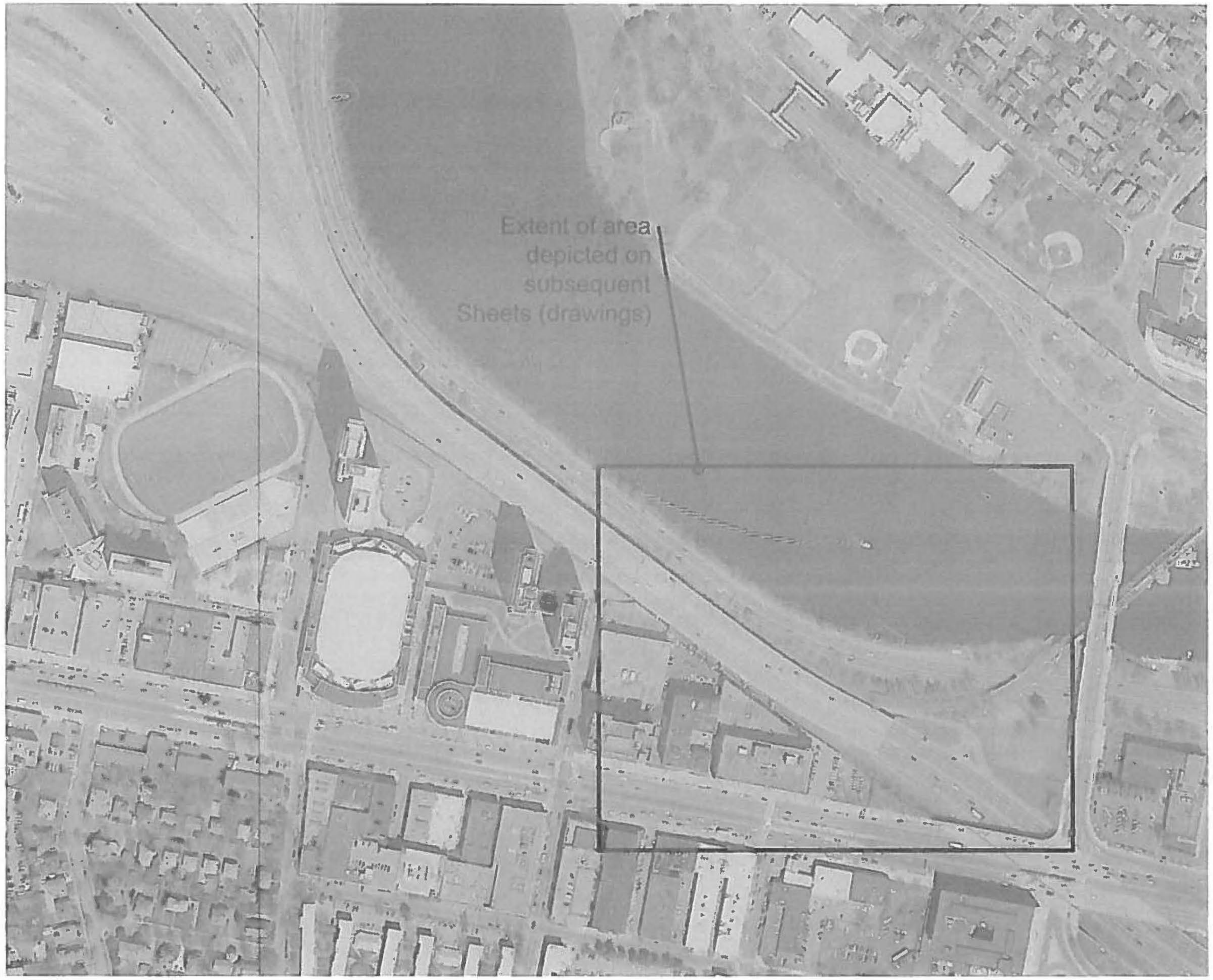
Sheet Title:

Construction Staging:
ABC Proposed Alternative 2,
I-90 WB At-Grade, Stage 2

Project		Sheet
Date	12/14/14	C–3
Scale	N.A.	

ABC COMMENTS FINAL DESIGN AT-GRADE.dwg

12/14/2014


Extent of area
depicted on
subsequent
Sheets (drawings)

General Notes /
Revision No.–Issue (Date)

1. "Black" (color) box shows extent of area depicted (locus) on subsequent Sheets (drawings), unless otherwise noted.

N

Project Name and Address

A BETTER CITY:
COMMENTS ON I–90 ALLSTON
INTERCHANGE PROJECT

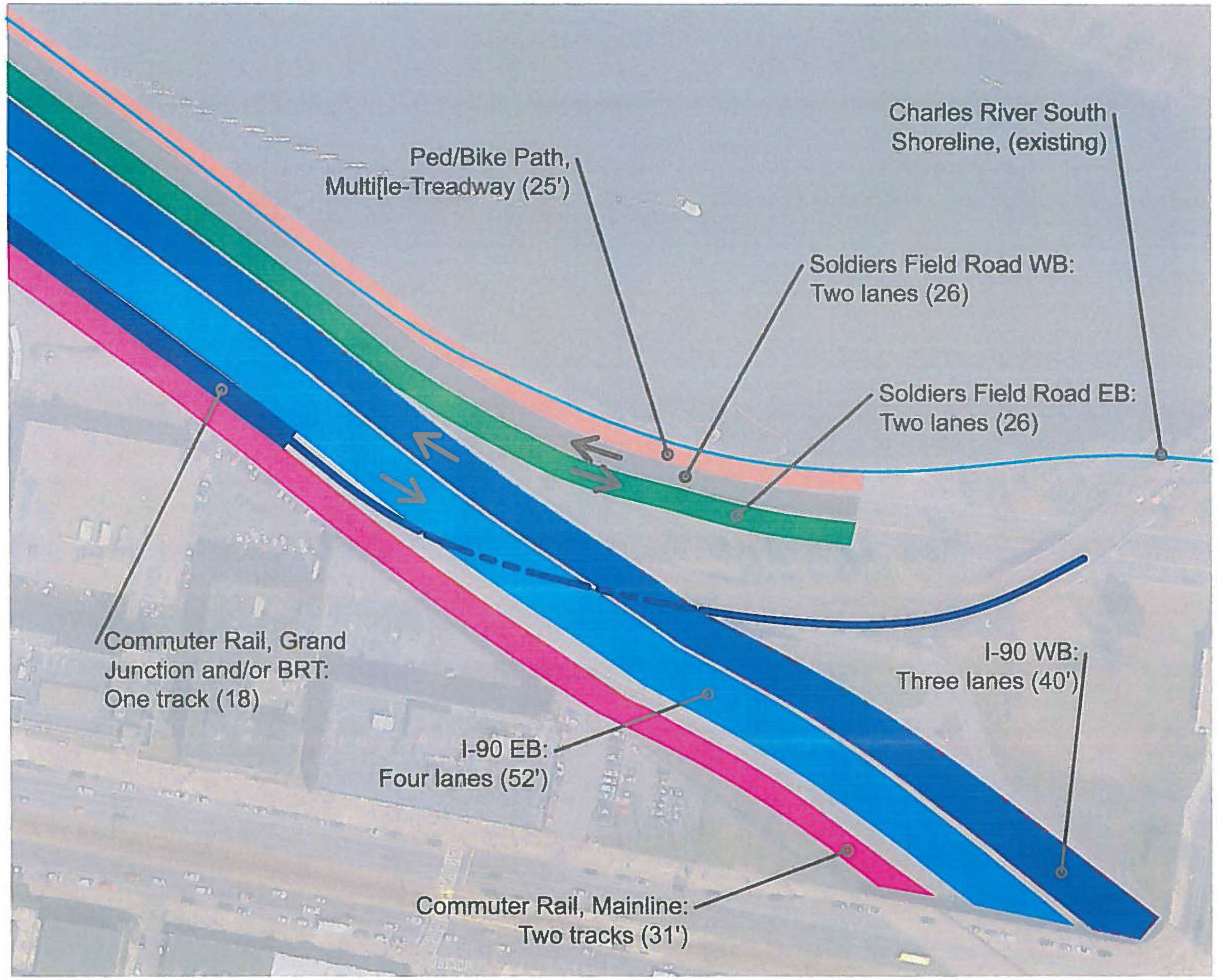
Sheet Title:

ABC Final Design Alternative:
I-90 All At-Grade,
Locus Plan

Project		Sheet
Date	12/14/14	D–1
Scale	N.A.	

ABC COMMENTS FINAL DESIGN AT-GRADE.dwg

12/14/2014


Ped/Bike Path,
Multi[le-Treadway (25')
Charles River South
Shoreline, (existing)
Soldiers Field Road WB:
Two lanes (26)
Soldiers Field Road EB:
Two lanes (26)
Commuter Rail, Grand
Junction and/or BRT:
One track (18)
I-90 WB:
Three lanes (40')
I-90 EB:
Four lanes (52')
Commuter Rail, Mainline:
Two tracks (31')

General Notes /
Revision No.–Issue (Date)

1. All sections of tracks or lanes assumed minimum of 2' for jersey barrier separation.
2. Grand Junction and/or BRT single track/way would likely go "under" the I-90 cross-section. Options include some section of retained fil and short overpass structurel to raise I-90 above GJ/BRT corridor.
3. Based on existing Layout Line on South (BU) side.

N

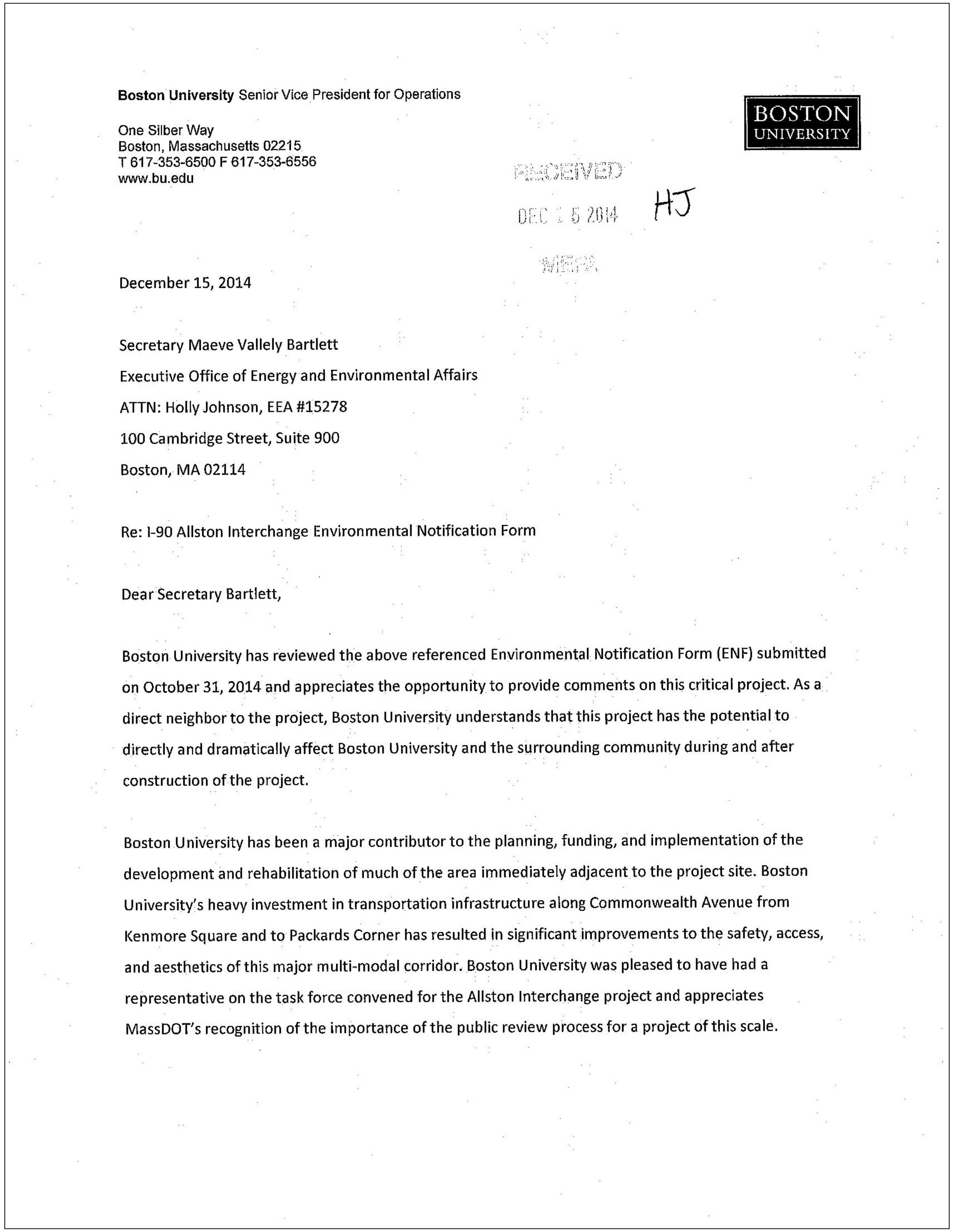
Project Name and Address

A BETTER CITY:
COMMENTS ON I–90 ALLSTON
INTERCHANGE PROJECT

Sheet Title:

ABC Final Design Alternative:
I-90 All At-Grade,
Concept Feasibility

Project		Sheet
Date	12/14/14	D—2
Scale	N.A.	



Boston University Senior Vice President for Operations

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www.bu.edu

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UNIVERSITY

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December 15, 2014

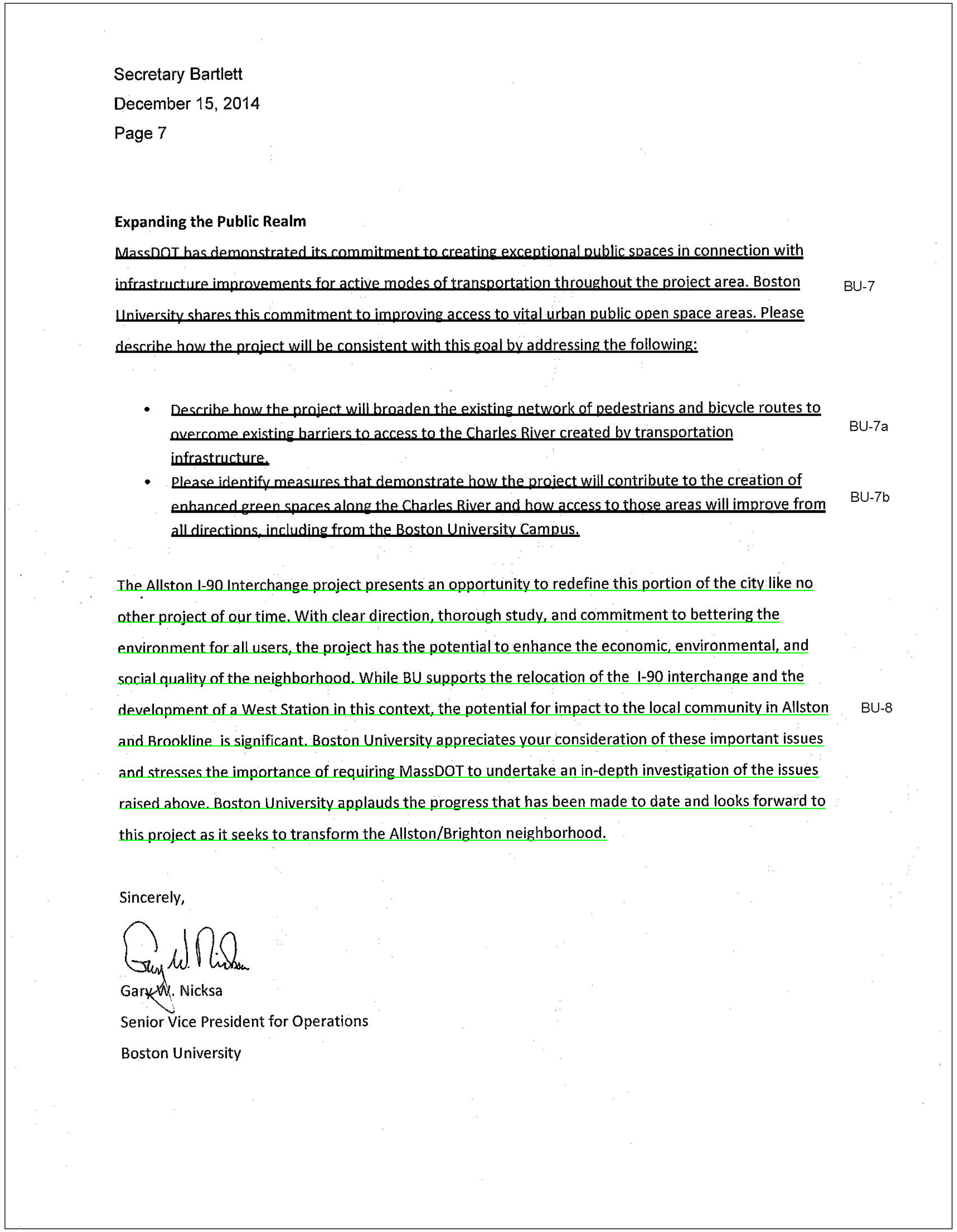
Secretary Maeve Vallely Bartlett
Executive Office of Energy and Environmental Affairs
ATTN: Holly Johnson, EEA #15278
100 Cambridge Street, Suite 900
Boston, MA 02114

Re: I-90 Allston Interchange Environmental Notification Form

Dear Secretary Bartlett,

Boston University has reviewed the above referenced Environmental Notification Form (ENF) submitted on October 31, 2014 and appreciates the opportunity to provide comments on this critical project. As a direct neighbor to the project, Boston University understands that this project has the potential to directly and dramatically affect Boston University and the surrounding community during and after construction of the project.

Boston University has been a major contributor to the planning, funding, and implementation of the development and rehabilitation of much of the area immediately adjacent to the project site. Boston University's heavy investment in transportation infrastructure along Commonwealth Avenue from Kenmore Square and to Packards Corner has resulted in significant improvements to the safety, access, and aesthetics of this major multi-modal corridor. Boston University was pleased to have had a representative on the task force convened for the Allston Interchange project and appreciates MassDOT's recognition of the importance of the public review process for a project of this scale.



Secretary Bartlett
December 15, 2014
Page 7

Expanding the Public Realm

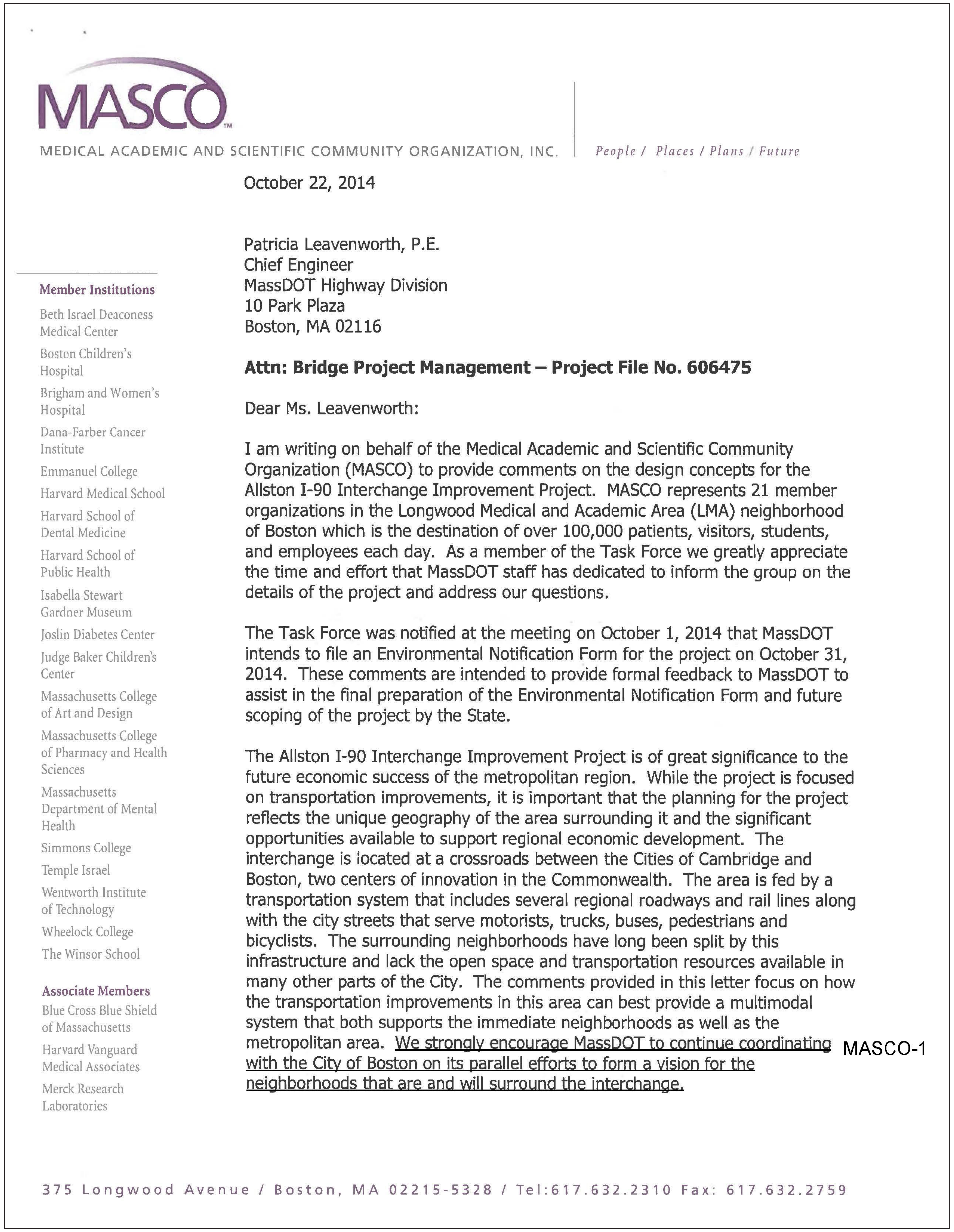
MassDOT has demonstrated its commitment to creating exceptional public spaces in connection with infrastructure improvements for active modes of transportation throughout the project area. Boston University shares this commitment to improving access to vital urban public open space areas. Please describe how the project will be consistent with this goal by addressing the following: BU-7

- Describe how the project will broaden the existing network of pedestrians and bicycle routes to overcome existing barriers to access to the Charles River created by transportation infrastructure. BU-7a
- Please identify measures that demonstrate how the project will contribute to the creation of enhanced green spaces along the Charles River and how access to those areas will improve from all directions, including from the Boston University Campus. BU-7b

The Allston I-90 Interchange project presents an opportunity to redefine this portion of the city like no other project of our time. With clear direction, thorough study, and commitment to bettering the environment for all users, the project has the potential to enhance the economic, environmental, and social quality of the neighborhood. While BU supports the relocation of the I-90 interchange and the development of a West Station in this context, the potential for impact to the local community in Allston and Brookline is significant. Boston University appreciates your consideration of these important issues and stresses the importance of requiring MassDOT to undertake an in-depth investigation of the issues raised above. Boston University applauds the progress that has been made to date and looks forward to this project as it seeks to transform the Allston/Brighton neighborhood. BU-8

Sincerely,

Gary W. Nicksa
Senior Vice President for Operations
Boston University



MASCO™
MEDICAL ACADEMIC AND SCIENTIFIC COMMUNITY ORGANIZATION, INC. | *People / Places / Plans / Future*

October 22, 2014

Patricia Leavenworth, P.E.
Chief Engineer
MassDOT Highway Division
10 Park Plaza
Boston, MA 02116

Attn: Bridge Project Management – Project File No. 606475

Dear Ms. Leavenworth:

I am writing on behalf of the Medical Academic and Scientific Community Organization (MASCO) to provide comments on the design concepts for the Allston I-90 Interchange Improvement Project. MASCO represents 21 member organizations in the Longwood Medical and Academic Area (LMA) neighborhood of Boston which is the destination of over 100,000 patients, visitors, students, and employees each day. As a member of the Task Force we greatly appreciate the time and effort that MassDOT staff has dedicated to inform the group on the details of the project and address our questions.

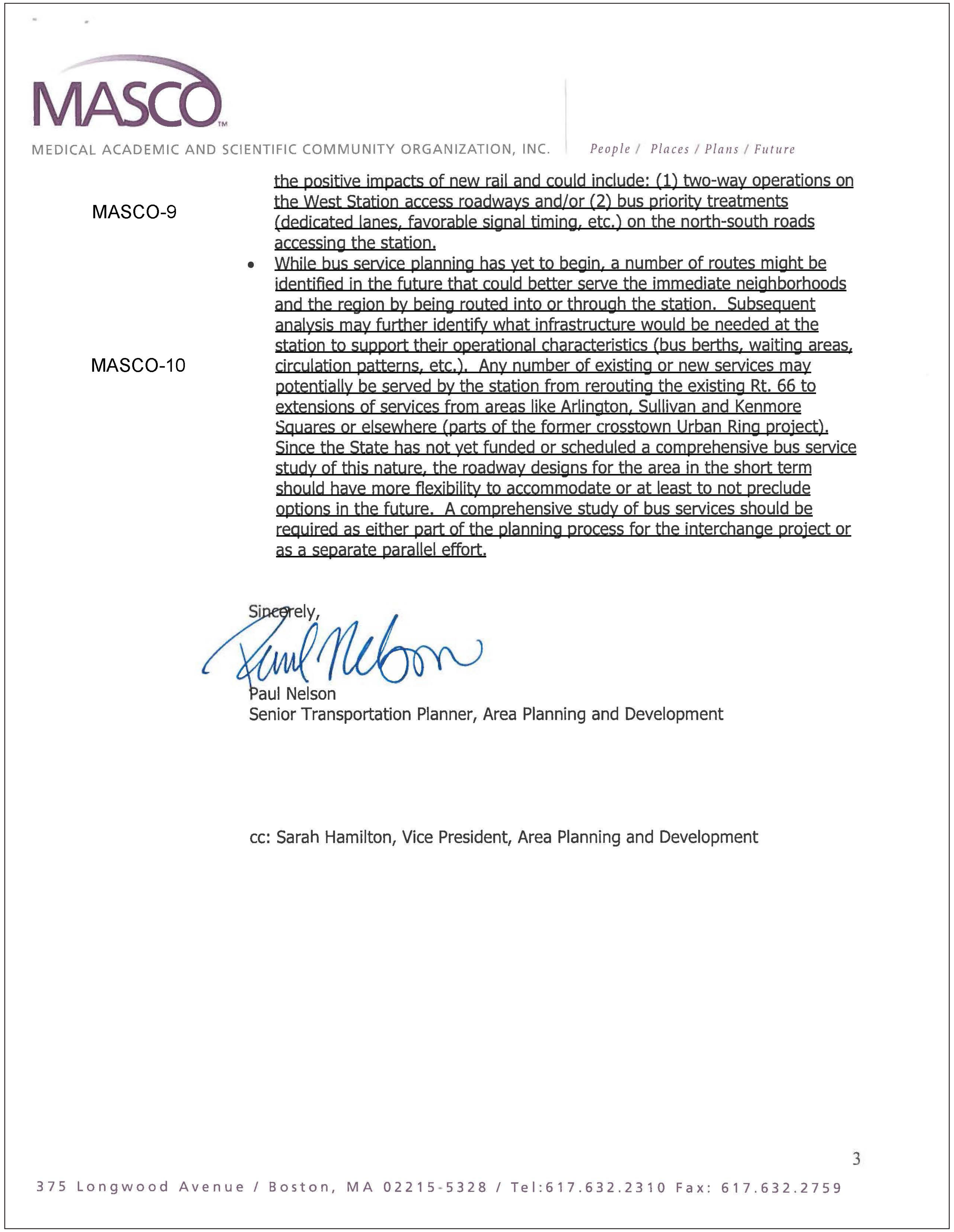
The Task Force was notified at the meeting on October 1, 2014 that MassDOT intends to file an Environmental Notification Form for the project on October 31, 2014. These comments are intended to provide formal feedback to MassDOT to assist in the final preparation of the Environmental Notification Form and future scoping of the project by the State.

The Allston I-90 Interchange Improvement Project is of great significance to the future economic success of the metropolitan region. While the project is focused on transportation improvements, it is important that the planning for the project reflects the unique geography of the area surrounding it and the significant opportunities available to support regional economic development. The interchange is located at a crossroads between the Cities of Cambridge and Boston, two centers of innovation in the Commonwealth. The area is fed by a transportation system that includes several regional roadways and rail lines along with the city streets that serve motorists, trucks, buses, pedestrians and bicyclists. The surrounding neighborhoods have long been split by this infrastructure and lack the open space and transportation resources available in many other parts of the City. The comments provided in this letter focus on how the transportation improvements in this area can best provide a multimodal system that both supports the immediate neighborhoods as well as the metropolitan area. We strongly encourage MassDOT to continue coordinating with the City of Boston on its parallel efforts to form a vision for the neighborhoods that are and will surround the interchange. MASCO-1

Member Institutions
Beth Israel Deaconess Medical Center
Boston Children's Hospital
Brigham and Women's Hospital
Dana-Farber Cancer Institute
Emmanuel College
Harvard Medical School
Harvard School of Dental Medicine
Harvard School of Public Health
Isabella Stewart Gardner Museum
Joslin Diabetes Center
Judge Baker Children's Center
Massachusetts College of Art and Design
Massachusetts College of Pharmacy and Health Sciences
Massachusetts Department of Mental Health
Simmons College
Temple Israel
Wentworth Institute of Technology
Wheelock College
The Winsor School

Associate Members
Blue Cross Blue Shield of Massachusetts
Harvard Vanguard Medical Associates
Merck Research Laboratories

375 Longwood Avenue / Boston, MA 02215-5328 / Tel:617.632.2310 Fax: 617.632.2759



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MASCO-9 the positive impacts of new rail and could include: (1) two-way operations on the West Station access roadways and/or (2) bus priority treatments (dedicated lanes, favorable signal timing, etc.) on the north-south roads accessing the station.

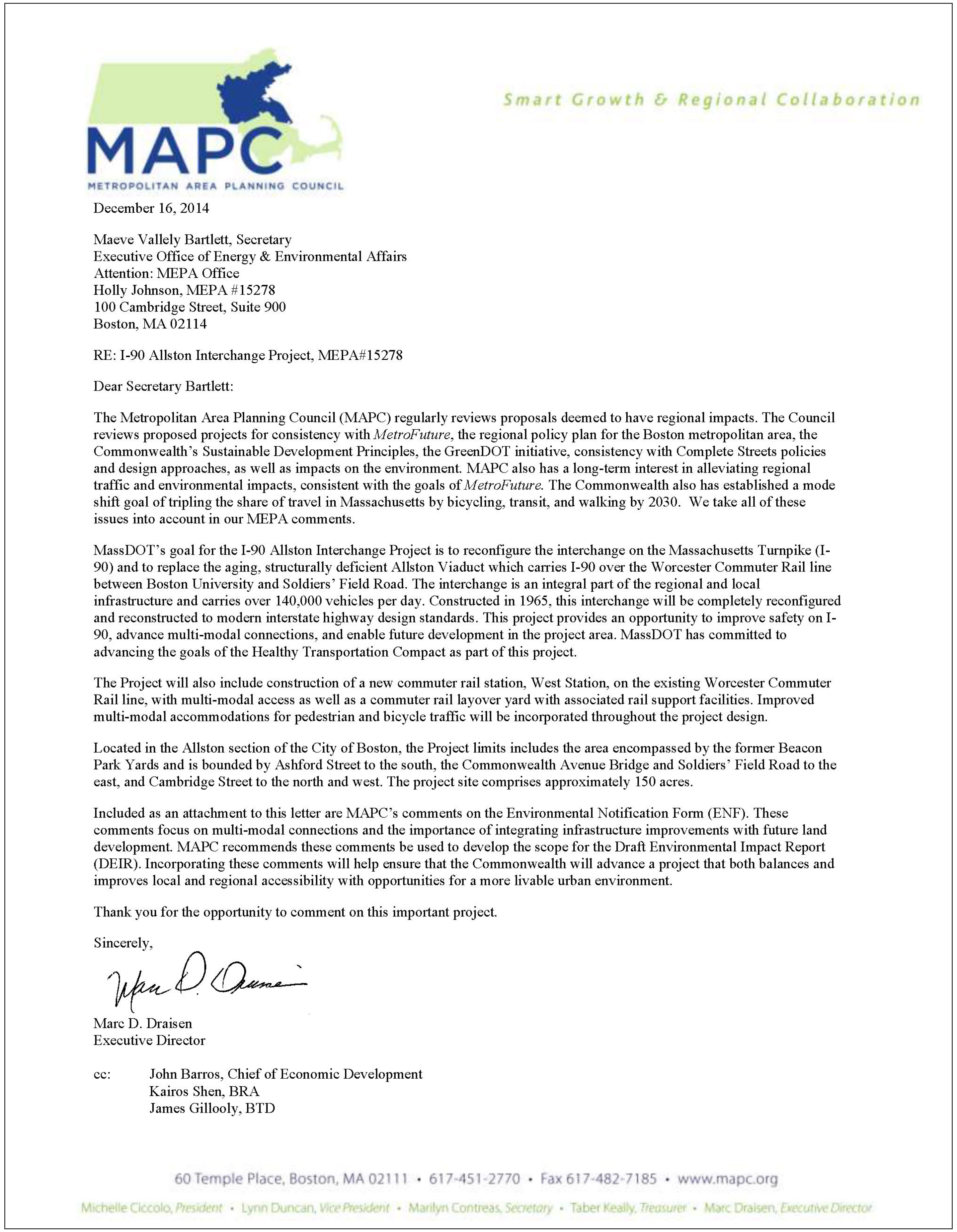
- While bus service planning has yet to begin, a number of routes might be identified in the future that could better serve the immediate neighborhoods and the region by being routed into or through the station. Subsequent analysis may further identify what infrastructure would be needed at the station to support their operational characteristics (bus berths, waiting areas, circulation patterns, etc.). MASCO-10 Any number of existing or new services may potentially be served by the station from rerouting the existing Rt. 66 to extensions of services from areas like Arlington, Sullivan and Kenmore Squares or elsewhere (parts of the former crosstown Urban Ring project). Since the State has not yet funded or scheduled a comprehensive bus service study of this nature, the roadway designs for the area in the short term should have more flexibility to accommodate or at least to not preclude options in the future. A comprehensive study of bus services should be required as either part of the planning process for the interchange project or as a separate parallel effort.

Sincerely,

Paul Nelson

Paul Nelson
Senior Transportation Planner, Area Planning and Development

cc: Sarah Hamilton, Vice President, Area Planning and Development



MAPC
METROPOLITAN AREA PLANNING COUNCIL
Smart Growth & Regional Collaboration

December 16, 2014

Maeve Vallely Bartlett, Secretary
Executive Office of Energy & Environmental Affairs
Attention: MEPA Office
Holly Johnson, MEPA #15278
100 Cambridge Street, Suite 900
Boston, MA 02114

RE: I-90 Allston Interchange Project, MEPA#15278

Dear Secretary Bartlett:

The Metropolitan Area Planning Council (MAPC) regularly reviews proposals deemed to have regional impacts. The Council reviews proposed projects for consistency with *MetroFuture*, the regional policy plan for the Boston metropolitan area, the Commonwealth's Sustainable Development Principles, the GreenDOT initiative, consistency with Complete Streets policies and design approaches, as well as impacts on the environment. MAPC also has a long-term interest in alleviating regional traffic and environmental impacts, consistent with the goals of *MetroFuture*. The Commonwealth also has established a mode shift goal of tripling the share of travel in Massachusetts by bicycling, transit, and walking by 2030. We take all of these issues into account in our MEPA comments.

MassDOT's goal for the I-90 Allston Interchange Project is to reconfigure the interchange on the Massachusetts Turnpike (I-90) and to replace the aging, structurally deficient Allston Viaduct which carries I-90 over the Worcester Commuter Rail line between Boston University and Soldiers' Field Road. The interchange is an integral part of the regional and local infrastructure and carries over 140,000 vehicles per day. Constructed in 1965, this interchange will be completely reconfigured and reconstructed to modern interstate highway design standards. This project provides an opportunity to improve safety on I-90, advance multi-modal connections, and enable future development in the project area. MassDOT has committed to advancing the goals of the Healthy Transportation Compact as part of this project.

The Project will also include construction of a new commuter rail station, West Station, on the existing Worcester Commuter Rail line, with multi-modal access as well as a commuter rail layover yard with associated rail support facilities. Improved multi-modal accommodations for pedestrian and bicycle traffic will be incorporated throughout the project design.

Located in the Allston section of the City of Boston, the Project limits includes the area encompassed by the former Beacon Park Yards and is bounded by Ashford Street to the south, the Commonwealth Avenue Bridge and Soldiers' Field Road to the east, and Cambridge Street to the north and west. The project site comprises approximately 150 acres.

Included as an attachment to this letter are MAPC's comments on the Environmental Notification Form (ENF). These comments focus on multi-modal connections and the importance of integrating infrastructure improvements with future land development. MAPC recommends these comments be used to develop the scope for the Draft Environmental Impact Report (DEIR). Incorporating these comments will help ensure that the Commonwealth will advance a project that both balances and improves local and regional accessibility with opportunities for a more livable urban environment.

Thank you for the opportunity to comment on this important project.

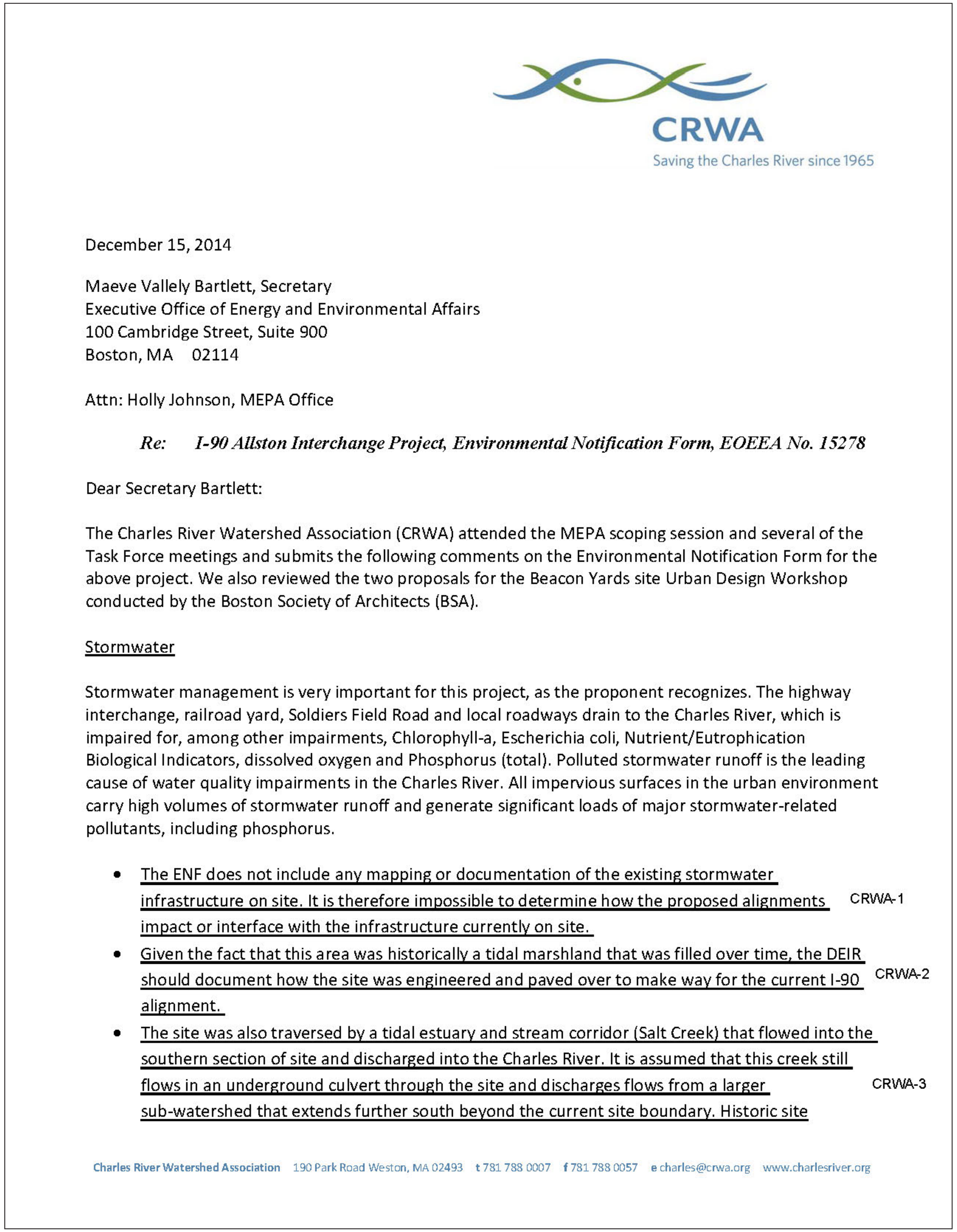
Sincerely,

Marc D. Draisen
Executive Director

cc: John Barros, Chief of Economic Development
Kairos Shen, BRA
James Gillooly, BTD

60 Temple Place, Boston, MA 02111 • 617-451-2770 • Fax 617-482-7185 • www.mapc.org

Michelle Ciccolo, *President* • Lynn Duncan, *Vice President* • Marilyn Contreas, *Secretary* • Taber Keally, *Treasurer* • Marc Draisen, *Executive Director*



CRWA
Saving the Charles River since 1965

December 15, 2014

Maeve Vallely Bartlett, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Attn: Holly Johnson, MEPA Office

Re: I-90 Allston Interchange Project, Environmental Notification Form, EOEEA No. 15278

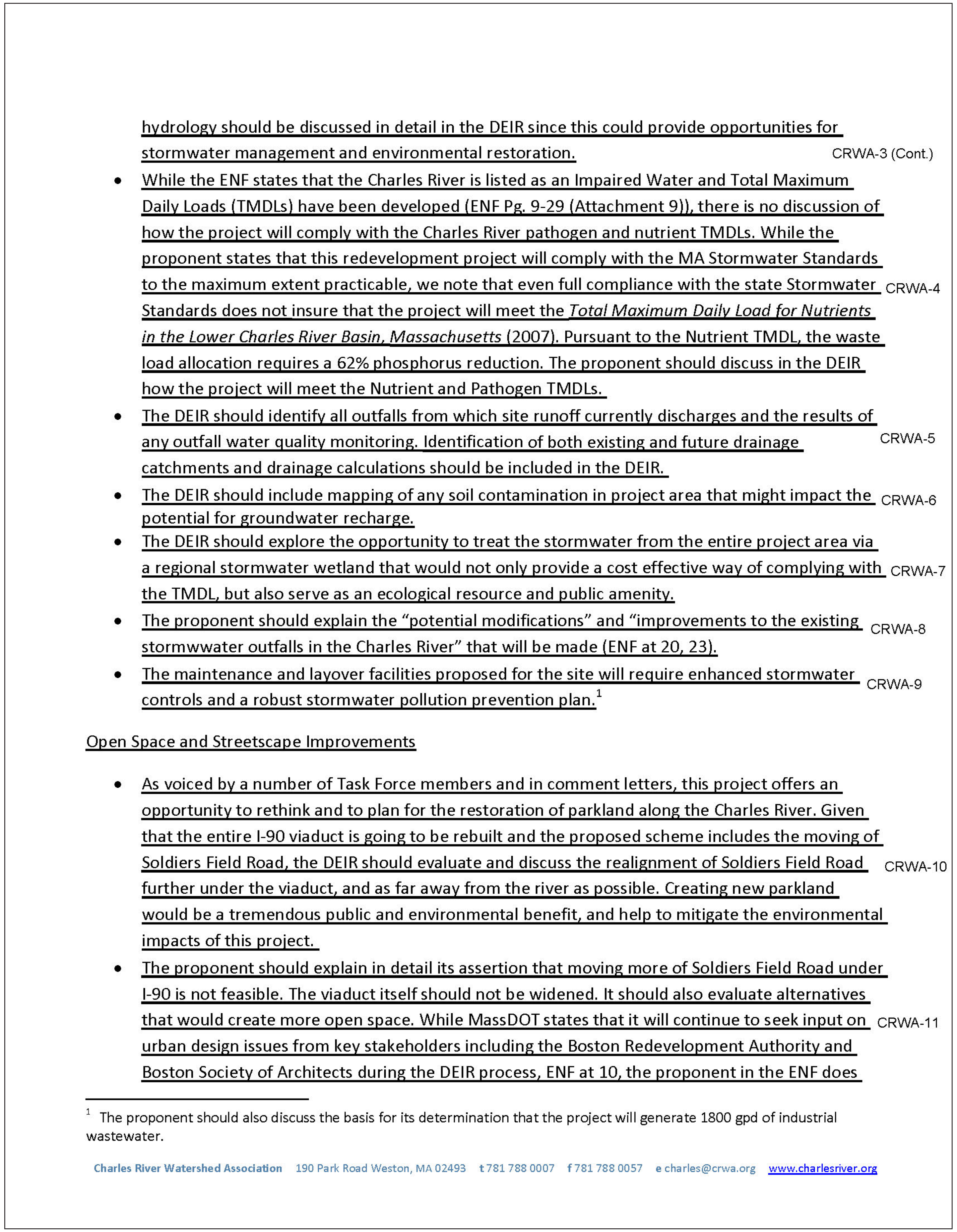
Dear Secretary Bartlett:

The Charles River Watershed Association (CRWA) attended the MEPA scoping session and several of the Task Force meetings and submits the following comments on the Environmental Notification Form for the above project. We also reviewed the two proposals for the Beacon Yards site Urban Design Workshop conducted by the Boston Society of Architects (BSA).

Stormwater

Stormwater management is very important for this project, as the proponent recognizes. The highway interchange, railroad yard, Soldiers Field Road and local roadways drain to the Charles River, which is impaired for, among other impairments, Chlorophyll-a, Escherichia coli, Nutrient/Eutrophication Biological Indicators, dissolved oxygen and Phosphorus (total). Polluted stormwater runoff is the leading cause of water quality impairments in the Charles River. All impervious surfaces in the urban environment carry high volumes of stormwater runoff and generate significant loads of major stormwater-related pollutants, including phosphorus.

- The ENF does not include any mapping or documentation of the existing stormwater infrastructure on site. It is therefore impossible to determine how the proposed alignments impact or interface with the infrastructure currently on site. CRWA-1
- Given the fact that this area was historically a tidal marshland that was filled over time, the DEIR should document how the site was engineered and paved over to make way for the current I-90 alignment. CRWA-2
- The site was also traversed by a tidal estuary and stream corridor (Salt Creek) that flowed into the southern section of site and discharged into the Charles River. It is assumed that this creek still flows in an underground culvert through the site and discharges flows from a larger sub-watershed that extends further south beyond the current site boundary. Historic site hydrology should be discussed in detail in the DEIR since this could provide opportunities for stormwater management and environmental restoration. CRWA-3 CRWA-3 (Cont.)



- While the ENF states that the Charles River is listed as an Impaired Water and Total Maximum Daily Loads (TMDLs) have been developed (ENF Pg. 9-29 (Attachment 9)), there is no discussion of how the project will comply with the Charles River pathogen and nutrient TMDLs. While the proponent states that this redevelopment project will comply with the MA Stormwater Standards to the maximum extent practicable, we note that even full compliance with the state Stormwater Standards does not insure that the project will meet the *Total Maximum Daily Load for Nutrients in the Lower Charles River Basin, Massachusetts* (2007). Pursuant to the Nutrient TMDL, the waste load allocation requires a 62% phosphorus reduction. The proponent should discuss in the DEIR how the project will meet the Nutrient and Pathogen TMDLs. CRWA-4
- The DEIR should identify all outfalls from which site runoff currently discharges and the results of any outfall water quality monitoring. Identification of both existing and future drainage catchments and drainage calculations should be included in the DEIR. CRWA-5
- The DEIR should include mapping of any soil contamination in project area that might impact the potential for groundwater recharge. CRWA-6
- The DEIR should explore the opportunity to treat the stormwater from the entire project area via a regional stormwater wetland that would not only provide a cost effective way of complying with the TMDL, but also serve as an ecological resource and public amenity. CRWA-7
- The proponent should explain the "potential modifications" and "improvements to the existing stormwwater outfalls in the Charles River" that will be made (ENF at 20, 23). CRWA-8
- The maintenance and layover facilities proposed for the site will require enhanced stormwater controls and a robust stormwater pollution prevention plan.[1] CRWA-9

Open Space and Streetscape Improvements

- As voiced by a number of Task Force members and in comment letters, this project offers an opportunity to rethink and to plan for the restoration of parkland along the Charles River. Given that the entire I-90 viaduct is going to be rebuilt and the proposed scheme includes the moving of Soldiers Field Road, the DEIR should evaluate and discuss the realignment of Soldiers Field Road further under the viaduct, and as far away from the river as possible. Creating new parkland would be a tremendous public and environmental benefit, and help to mitigate the environmental impacts of this project. CRWA-10
- The proponent should explain in detail its assertion that moving more of Soldiers Field Road under I-90 is not feasible. The viaduct itself should not be widened. It should also evaluate alternatives that would create more open space. While MassDOT states that it will continue to seek input on urban design issues from key stakeholders including the Boston Redevelopment Authority and Boston Society of Architects during the DEIR process, ENF at 10, the proponent in the ENF does CRWA-11

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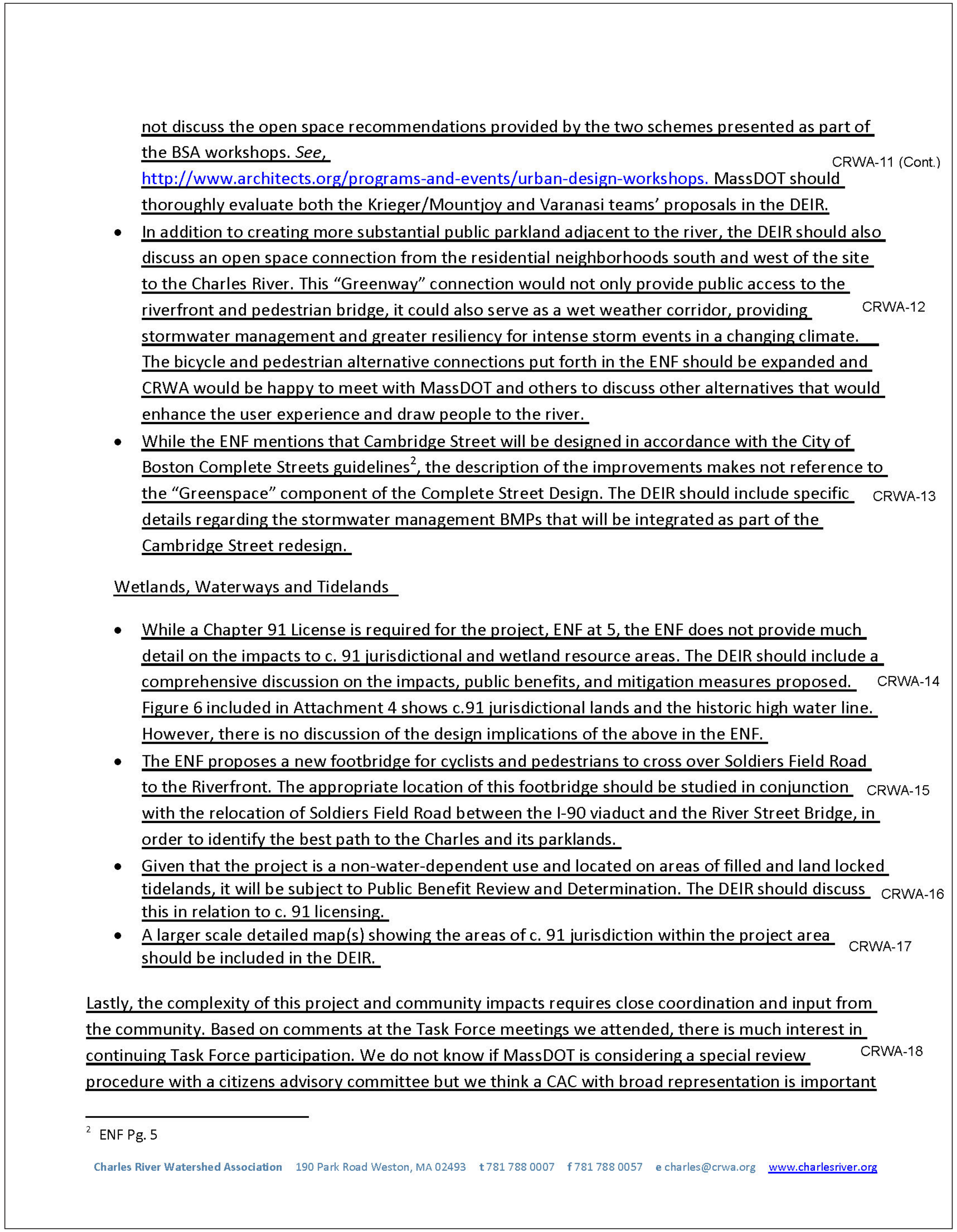
[1] The proponent should also discuss the basis for its determination that the project will generate 1800 gpd of industrial wastewater.



not discuss the open space recommendations provided by the two schemes presented as part of the BSA workshops. *See*, http://www.architects.org/programs-and-events/urban-design-workshops. MassDOT should thoroughly evaluate both the Krieger/Mountjoy and Varanasi teams' proposals in the DEIR. CRWA-11 (Cont.)

- In addition to creating more substantial public parkland adjacent to the river, the DEIR should also discuss an open space connection from the residential neighborhoods south and west of the site to the Charles River. This "Greenway" connection would not only provide public access to the riverfront and pedestrian bridge, it could also serve as a wet weather corridor, providing stormwater management and greater resiliency for intense storm events in a changing climate. The bicycle and pedestrian alternative connections put forth in the ENF should be expanded and CRWA would be happy to meet with MassDOT and others to discuss other alternatives that would enhance the user experience and draw people to the river. CRWA-12
- While the ENF mentions that Cambridge Street will be designed in accordance with the City of Boston Complete Streets guidelines[2], the description of the improvements makes not reference to the "Greenspace" component of the Complete Street Design. The DEIR should include specific details regarding the stormwater management BMPs that will be integrated as part of the Cambridge Street redesign. CRWA-13

Wetlands, Waterways and Tidelands

- While a Chapter 91 License is required for the project, ENF at 5, the ENF does not provide much detail on the impacts to c. 91 jurisdictional and wetland resource areas. The DEIR should include a comprehensive discussion on the impacts, public benefits, and mitigation measures proposed. Figure 6 included in Attachment 4 shows c.91 jurisdictional lands and the historic high water line. However, there is no discussion of the design implications of the above in the ENF. CRWA-14
- The ENF proposes a new footbridge for cyclists and pedestrians to cross over Soldiers Field Road to the Riverfront. The appropriate location of this footbridge should be studied in conjunction with the relocation of Soldiers Field Road between the I-90 viaduct and the River Street Bridge, in order to identify the best path to the Charles and its parklands. CRWA-15
- Given that the project is a non-water-dependent use and located on areas of filled and land locked tidelands, it will be subject to Public Benefit Review and Determination. The DEIR should discuss this in relation to c. 91 licensing. CRWA-16
- A larger scale detailed map(s) showing the areas of c. 91 jurisdiction within the project area should be included in the DEIR. CRWA-17

Lastly, the complexity of this project and community impacts requires close coordination and input from the community. Based on comments at the Task Force meetings we attended, there is much interest in continuing Task Force participation. We do not know if MassDOT is considering a special review procedure with a citizens advisory committee but we think a CAC with broad representation is important CRWA-18

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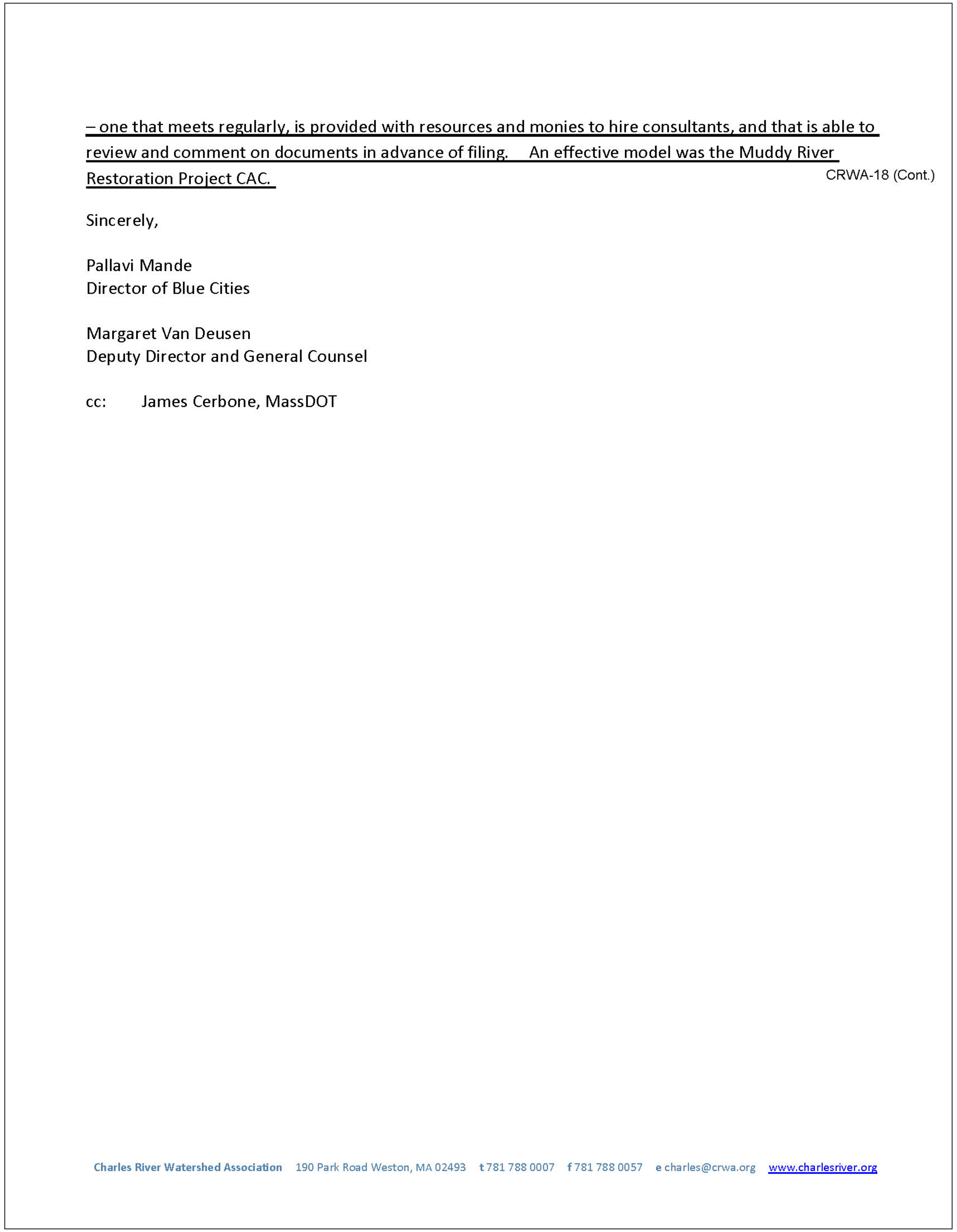
[2] ENF Pg. 5



– one that meets regularly, is provided with resources and monies to hire consultants, and that is able to review and comment on documents in advance of filing. An effective model was the Muddy River Restoration Project CAC. CRWA-18 (Cont.)

Sincerely,

Pallavi Mande
Director of Blue Cities

Margaret Van Deusen
Deputy Director and General Counsel

cc: James Cerbone, MassDOT

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'LPLWUL .RXQWRXU	'LFNLQVRQ 6WUHHW 6RPHUYLOOH 0$ GLPLWULN#DOXP PLW HGX
-RKQ 3HOOHWLHU	&HQWUDO $YHQXH 1HZWRQ 0$
$QLD :LHFNRZVNL	&RUH\ 5RDG %ULJKWRQ 0$
(ULFD 0DWWLVRQ	'RUFKHVWHU $YHQXH 'RUFKHVWHU 0$
-XOLD +DQVHQ	&KHVWQXW $YHQXH %RVWRQ 0$
0DWWKHZ 6RXOH	5RVH 6WUHHW 6RPHUYLOOH 0$
0DWW /DZORU	%DVWR 7HUUDFH 5RVOLQGDOH 0$
7RGG &RQVHQWLQR	$QQDIUDQ 6WUHHW %RVWRQ 0$
.DWKU\Q)DKH\	:DVKLQJWRQ 6WUHHW %ULJKWRQ 0$
$OOLH 6KHUZRRG	2UNQH\ 5RDG $SW %ULJKWRQ 0$
6WHSKDQLH 'DQLHO	'HSDUWPHQW RI 3ODQQLQJ &RPP 'HYHORSPHQW 7RZQ RI (DVWRQ (OP 6WUHHW (DVWRQ 0$
$UL 2IVHYLW	/DZUHQFH 6WUHHW &DPEULGJH 0$
-HIIHU\ 2UOLQ	1RQDQWXP 6WUHHW 1HZWRQ 0$
1LQD *DUÀQNOH	+RO\RNH 6WUHHW %RVWRQ 0$
5REHUW DQG 3DXOD $OH[DQGHU	1RUWK +DUYDUG 6WUHHW $OOVWRQ 0$
&DU\Q 2SSHQKHLP	+REDUW 6WUHHW %ULJKWRQ 0$

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7RP /DPDU	$GDPV 6WUHHW 6RPHUYLOOH 0$
-RVKXD %HOOLQ	.LOV\WK 7HUUDFH $SW %ULJKWRQ 0$
-R\FH 5DGQRU	+RSHGDOH 6WUHHW $OOVWRQ 0$
'DYLG .XVV	GDYHNXVV#JPDLO FRP
'UHZ 9ROSH	3URF\RQ 9HQWXUHV &KDQQHO &HQWHU 6WUHHW 8QLW %RVWRQ 0$
$UOHQH 0DWWLVRQ	3RQG $YHQXH %URRNOLQH 0$
,DQ +XWFKLQVRQ	0DVVDFKXVHWWV $YHQXH &DPEULGJH 0$ LDQFKLOOLQ#JPDLO FRP
-DVRQ 1HOVRQ	1HLOOLDQ :D\ %HGIRUG 0$ MWQHOVRQ #\DKRR FRP
)UDQNOLQ .LQJ ,9	0DSOH $YHQXH $SW &DPEULGJH 0$ NLQJIUDQNOLQ #JPDLO FRP
3ULVFLOOD $QGHUVRQ	:LQGRP 6WUHHW $OOVWRQ 0$
0DWWKHZ 'DQLVK	$VKIRUG 6WUHHW $OOVWRQ 0$ IRUPHU DGGUHVV KDV PRYHG PDWWKHZUGDQLVK#JPDLO FRP
5RFKHOOH 'XQQH	3UDWW 6WUHHW $OOVWRQ 0$
3DROD 0)HUUHU	5R\DO 6WUHHW %RVWRQ 0$
$QDEHOD *RPHV	8QGLQH 5RDG %ULJKWRQ 0$
%UXFH +RXJKWRQ	&DPEULGJH 6WUHHW $OOVWRQ 0$ EKRXJKWRQ#KRXJKWRQ FRP
:D\QH 0DF.HQ]LH	(DWRQLD 6WUHHW $OOVWRQ 0$
5LFN 3DUU	%DJQDO 6WUHHW $OOVWRQ 0$ ULFK SDUU#JPDLO FRP
-HVVLFD 5REHUWVRQ	5R\DO 6WUHHW $OOVWRQ 0$ MHVVLFDEHWKUREHUWVRQ#JPDLO FRP
-RKQ (VNHZ	5D\PRQG 6WUHHW $OOVWRQ 0$
.DWH .HOO\	&RPPRQZHDOWK $YHQXH %ULJKWRQ 0$
(OL]DEHWK (JDQ	&RPPRQZHDOWK $YHQXH %ULJKWRQ 0$
5LWD 9DLG\D	5D\PRQG 6WUHHW $OOVWRQ 0$
&DURO 2·+DUH DQG :DOWHU 0F'RQDOG	0DJD]LQH 6WUHHW &DPEULGJH 0$
'DYLG 5HDG	%URRNOLQH 6WUHHW &DPEULGJH 0$ GDYH#UHDGIDPLO\KRPH FRP
-RKQ 6KHWWHUO\	0DJD]LQH 6WUHHW &DPEULGJH 0$
)UHG 0DORQH\	0RQWIHUQ $YHQXH %ULJKWRQ 0$
-DQH 6WRO]PDQ DQG 0DUF +RIIPDQ	3XWQDP $YHQXH &DPEULGJH 0$
$UWKXU 6WUDQJ	)UHVK 3RQG 3DUNZD\ &DPEULGJH 0$ DUWKXUVWUDQJ#PVQ FRP
/DXUD .HUVKQHU	+HQU\ 6WUHHW &DPEULGJH 0$
2OLYLD)LVNH	0DJD]LQH 6WUHHW &DPEULGJH 0$ ÀVNHROLYLD#JPDLO FRP
Cathie Zusy	+DPLOWRQ 6WUHHW &DPEULGJH 0$
$QWKRQ\ 3DQJDUR	2QH &KDUOHV 6WUHHW 6RXWK ' %RVWRQ 0$
0DULO\Q :HOORQV	*UHHQ 6WUHHW &DPEULGJH 0$
*DOHQ 0RRN	5R\DO 6WUHHW $OOVWRQ 0$
3HWHU .OLQHIHOWHU	(ULH 6WUHHW &DPEULGJH 0$ SHWHUN#7KH:RUOG FRP
+DUU\ 0DWWLVRQ DOVR LQFOXGH LQ 7UDQVSRUWDWLRQ IRU 0$ 0HWWHU DQG 5RPDQD 2OVHQ	0DQVÀHOG 6WUHHW $OOVWRQ 0$
%ULDQ &RQZD\	&KHVWQXW 6WUHHW &DPEULGJH 0$
3K\OOLV DQG +DUYH\ %DXPDQQ	%D\ 6WUHHW &DPEULGJH 0$
3HJJ\ /\QFK DQG -DQ 3XLEHOOR	%URRNOLQH 6WUHHW &DPEULGJH 0$
'HFLD *RRGZLQ	&KHVWQXW 6WUHHW &DPEULGJH 0$
,EE\ DQG &KDUOLH .XU]RQ	)ORUHQFH 6WUHHW &DPEULGJH 0$
.ULVWLQ &DQDEDQ DQG 5RVV %HUEHFR	*HQZRRG $YHQXH &DPEULGJH 0$
&DURO\Q 6KLSOH\H\	/DXUHO 6WUHHW &DPEULGJH 0$
-LP 0RRUH	0DJD]LQH 6WUHHW &DPEULGJH 0$
/DUU\ .RQWRV	0DJD]LQH 6WUHHW &DPEULGJH 0$
7RP DQG .DUHQ 1RUWRQ	0DJD]LQH 6WUHHW &DPEULGJH 0$
3KLOLS 2OHQLFN	0DJD]LQH 6WUHHW &DPEULGJH 0$
&ROOHHQ &ODUN	:LOOLDP 6WUHHW &DPEULGJH 0$
-RKQ 6DQ]RQH -U	0HPRULDO 'ULYH &DPEULGJH 0$)RUPHU DGGUHVV MRKQ#OHPEXUHDOHVWDWH FRP
-XGLWK 0RW]NLQ	3HDUO 6WUHHW &DPEULGJH 0$ MPRW]NLQ#JPDLO FRP

DEIR Recipient	$IÀOLDWLRQ	Contact Information
Task Force		
*HUDOG $XWOHU	%RVWRQ 3ODQQLQJ DQG 'HYHORSPHQW $JHQF\	2QH &LW\ +DOO 3OD]D %RVWRQ JHUDOG DXWOHU#ERVWRQ JRY
+DUULV %DQG	+DUYDUG 8QLYHUVLW\	0DVVDFKXVHWWV $YHQXH KDUULVBEDQG#KDUYDUG HGX
-RVHSK %HJJDQ	+DUYDUG 8QLYHUVLW\	0DVVDFKXVHWWV $YHQXH MRVHSKBEHJJDQ#KDUYDUG HG
$QGUHZ %HWWLQHOOL	2IÀFH RI 6HQDWRU %URZQVEHUJHU	6WDWH +RXVH %RVWRQ DQGUHZ EHWWLQHOOL#PDVHQDWH JRY
-RUJH %ULRQHV	0%7$	6XPPHU 6WUHHW 6XLWH MEULRQHV#PEWD FRP
:LOOLDP %URZQVEHUJHU	6WDWH 6HQDWH	6WDWH +RXVH %RVWRQ ZLOOLDP EURZQVEHUJHU#PDVHQDWH JRY
0DUN &LRPPR	%RVWRQ &LW\ &RXQFLO	2QH &LW\ +DOO 3OD]D %RVWRQ PDUN FLRPPR#ERVWRQ JRY
+HQULHWWD 'DYLV	&DPEULGJHSRUW 5HVLGHQW	&KHVWQXW 6WUHHW &DPE KHQULHWWDGDYLV#JPDLO FRP
%LOO 'HLJQDQ	&LW\ RI &DPEULGJH	%URDGZD\ &DPEULGJH EGHLJQDQ#FDPEULGJHPD JRY
6DO 'L'RPHQLFR	6WDWH 6HQDWH	6WDWH +RXVH %RVWRQ VDO GLGRPHQLFR#PDVHQDWH JRY
5LFKDUG 'LPLQR	$ %HWWHU &LW\	%URDG 6WUHHW %RVWRQ UGLPLQR#DEHWWHUFLW\ RUJ
$QWKRQ\ ' ,VLGRUR	$OOVWRQ &LYLF $VVRFLDWLRQ	5D\PRQG 6WUHHW $OOVWR DQWKRQ\GLVLGRUR#PVQ FRP
%ULDQ 'RKHUW\	%RVWRQ %XLOGLQJ 7UDGHV &RXQFLO	(YHUGHDQ 6WUHHW 'RUFKHVWHU EULDQGRKHUW\#PHWUREXLOG
3DROD)HUUHU	&RPPXQLW\ 0HPEHU	5R\DO 6WUHHW $OOVWRQ SPIHUUHU#JPDLO FRP
5LFKDUG)ULHV	0DVV%LNH	0LON 6WUHHW %RVWRQ ULFKDUG#PDVVELNH RUJ
-LP *LOORRO\	%RVWRQ 7UDQVSRUWDWLRQ 'HSDUWPHQW	2QH &LW\ +DOO 3OD]D %RVW MDPHV JLOORRO\#ERVWRQ JRY
$QDEHOD *RPHV	%ULJKWRQ $OOVWRQ ,PSURYHPHQW $VVRFLDWLRQ	8QGLQH 5RDG %ULJKWRQ EHOD#PDLO FRP
9LQHHW *XSWD	%RVWRQ 7UDQVSRUWDWLRQ 'HSDUWPHQW	2QH &LW\ +DOO 3OD]D %RVW YLQHHW JXSWD#ERVWRQ JRY
.DUO +DJOXQG	'HSDUWPHQW RI &RQVHUYDWLRQ DQG 5HFUHDWLRQ	&DXVHZD\ 6WUHHW %RVWRQ NDUO KDJOXQG#VWDWH PD XV
.HYLQ +RQDQ	+RXVH RI 5HSUHVHQWDWLYHV	6WDWH +RXVH %RVWRQ NHYLQ KRQDQ#PDKRXVH JRY
%UXFH +RXJKWRQ	+RXJKWRQ &KHPLFDO	&DPEULGJH 6WUHHW $OOVWRQ EKRXJKWRQ#KRXJKWRQ FRP
0DUF .DGLVK	$OOVWRQ %RDUG RI 7UDGH	:RRGFKHVWHU 'ULYH 1HZW PDUFNDGLVK#FRPFDVW QHW
:HQG\ /DQGPDQ	:DON%RVWRQ	6FKRRO 6WUHHW %RVWRQ ZODQGPDQ#ZDONERVWRQ RUJ

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(OL]DEHWK /HDU\	%RVWRQ 8QLYHUVLW\	%D\ 6WDWH 5RDG %RVWRQ HUOHDU\#EX HGX
2VFDU /RSH]	5HSUHVHQWDWLYH +RQDQ V 2IÀFH	6WDWH +RXVH %RVWRQ RVFDU ORSH]#PDKRXVH JRY
'DYLG /RXW]HQKHLVHU &DPEULGJH	0HWURSROLWDQ $UHD 3ODQQLQJ &RXQFLO	7HPSOH 3ODFH %RVWRQ GORXW]HQKHLVHU#PDSF RUJ
:LOO /X]LHU	$OOVWRQ 5HVLGHQW	5LYHUGDOH 6WUHHW $OOVWR ERVWRQMS#HDUWKOLQN QHW
6HDQ 0DFDOXVR	2IÀFH RI 6HQDWRU 'L'RPHQLFR	6WDWH +RXVH %RVWRQ VHDQ PDFDOXVR#PDVHQDWH JRY
:D\QH 0DF.HQ]LH	&RPPXQLW\ 0HPEHU	(DWRQLD 6WUHHW $OOVWRQ ZD\QHPDFNHQ]LH#PVQ FRP
0DXUD 0DJXLUH	$$$ 6RXWKHUQ 1HZ (QJODQG	3URYLGHQFH +LJKZD\ :HVWZR PPDJXLUH#DDDVQH FRP
&ODQF\ 0DLQ	2IÀFH RI &RXQFLORU &LRPPR	2QH &LW\ +DOO 3OD]D %RVWRQ FODQF\ PDLQ#ERVWRQ JRY
&RUULQ 0HLVH 0XQQV	&KDUOHV 5LYHU :DWHUVKHG $VVRFLDWLRQ	3DUN 5RDG :HVWRQ FPHLVHPXQQV#FUZD RUJ
+DUU\ 0DWWLVRQ	&RPPXQLW\ 0HPEHU	0DQVÀHOG $OOVWRQ KDUU\PDWWLVRQ#JPDLO FRP
.HQ 0LOOHU	)HGHUDO +LJKZD\ $GPLQLVWUDWLRQ	%URDGZD\ &DPEULGJH NHQQHWK PLOOHU#GRW JRY
*DOHQ 0RRN	&RPPXQLW\ 0HPEHU	5R\DO 6WUHHW $OOVWRQ JPPRRN#JPDLO FRP
0LFKDHO 0RUDQ	+RXVH RI 5HSUHVHQWDWLYHV	6WDWH +RXVH %RVWRQ PLFKDHO PRUDQ#PDKRXVH JRY
7RP 1DOO\	$ %HWWHU &LW\	%URDG 6WUHHW %RVWRQ WQDOO\#DEHWWHUFLW\ RUJ
3DXO 1HOVRQ	0$6&2	/RQJZRRG $YHQXH %RVWRQ SQHOVRQ#PDVFR KDUYDUG HGX
$UL 2IVHYLW	/LYDEOH6WUHHWV $OOLDQFH	3DFLÀF 6WUHHW DUL RIVHYLW#JPDLO FRP
:DUUHQ - 2 5HLOO\	0D\RU V 2IÀFH RI 1HLJKERUKRRG 6HUYLFHV	&LW\ +DOO 3OD]D %RVWRQ ZDUUHQ RUHLOO\#ERVWRQ JRY
-RKQ 3RXUEDL[	&RQVWUXFWLRQ ,QGXVWULHV RI 0DVVDFKXVHWWV	3URYLGHQFH +LJKZD\ 1RUZR MSRXUEDL[#FLPDVV RUJ
6XVDQQH 5DVPXVVHQ	&LW\ RI &DPEULGJH	%URDGZD\ &DPEULGJH VUDVPXVVHQ#FDPEULGJHPD JRY
7DG 5HDG	%RVWRQ 3ODQQLQJ DQG 'HYHORSPHQW $JHQF\	2QH &LW\ +DOO 3OD]D %RVWRQ MRKQ UHDG EUD#ERVWRQ JRY
&DURO 5LGJH 0DUWLQH]	$OOVWRQ %ULJKWRQ &'&	/LQGHQ 6WUHHW $OOVWRQ ULGJHPDUWLQH]#$OOVWRQ%ULJK
-HVVLFD 5REHUWVRQ	&RPPXQLW\ 0HPEHU	5R\DO 6WUHHW $OOVWRQ MHVVLFDEHWKUREHUWVRQ#JPDL
6WHIDQLH 6HVNLQ	%RVWRQ 7UDQVSRUWDWLRQ 'HSDUWPHQW	2QH &LW\ +DOO 3OD]D %RVWRQ VWHIDQLH VHVNLQ#ERVWRQ JRY

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In addition to serving as a Task Force member, this individual submitted a comment letter on the ENF and is listed previously as a DEIR recipient.